

**IBM** Customer Engineering  
Reference Manual

**IBM 7040-7044 Data Processing Systems**  
**Channels B, C, D, and E**



**Customer Engineering Reference Manual  
IBM 7040-7044 Data Processing Systems  
Channels B, C, D, and E**

## PREFACE

This manual contains logic diagrams for IBM 7904 tape operations only. A future edition will include simplex interface operations, direct data operations, and other reference material.

The order of the diagrams in this manual closely follows that of the text of the 7904 Data Channel manual, Form R23-2595; therefore, the diagrams can be used as instruction aids as well as for troubleshooting.

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## SAFETY

Accidents do not always happen to "the other fellow." Be smart! When servicing any equipment, remove rings and watches, roll up your sleeves, and tuck in your tie. Put on your safety glasses! If power must be on when working on power supplies, probe with one hand only; keep the other hand off the frame. You know the safety rules--follow them!

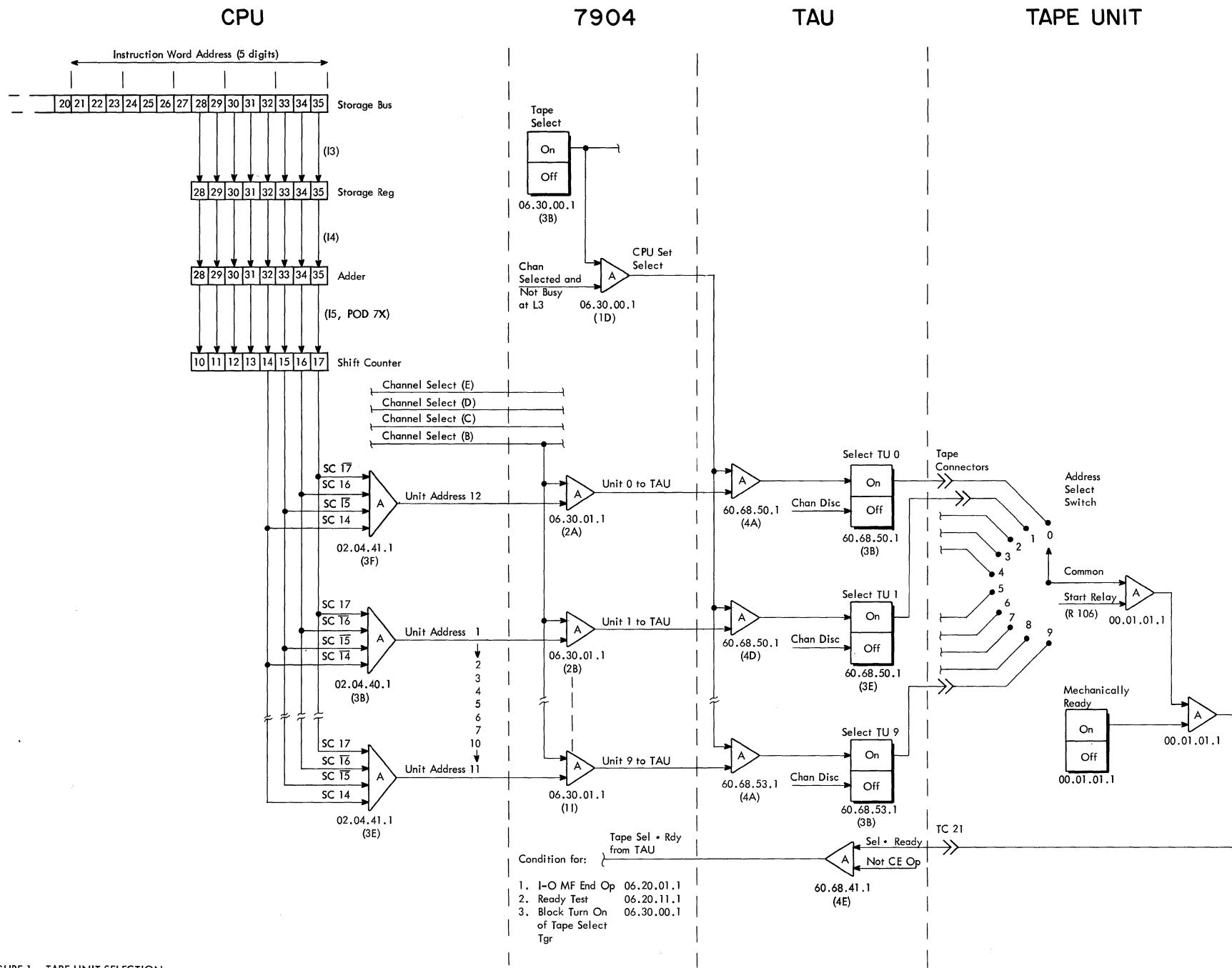


FIGURE 1. TAPE UNIT SELECTION

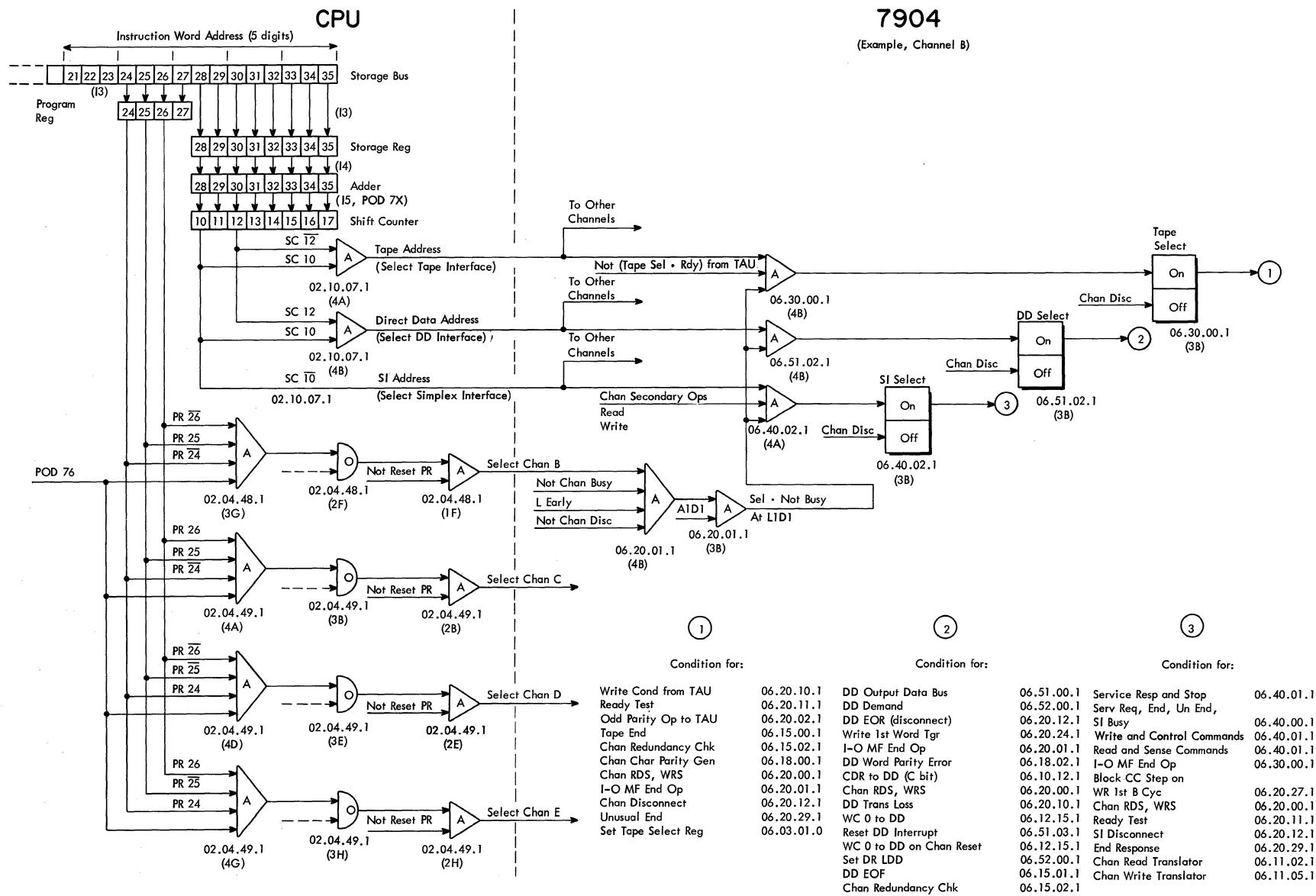


FIGURE 2. CHANNEL AND INTERFACE SELECTION

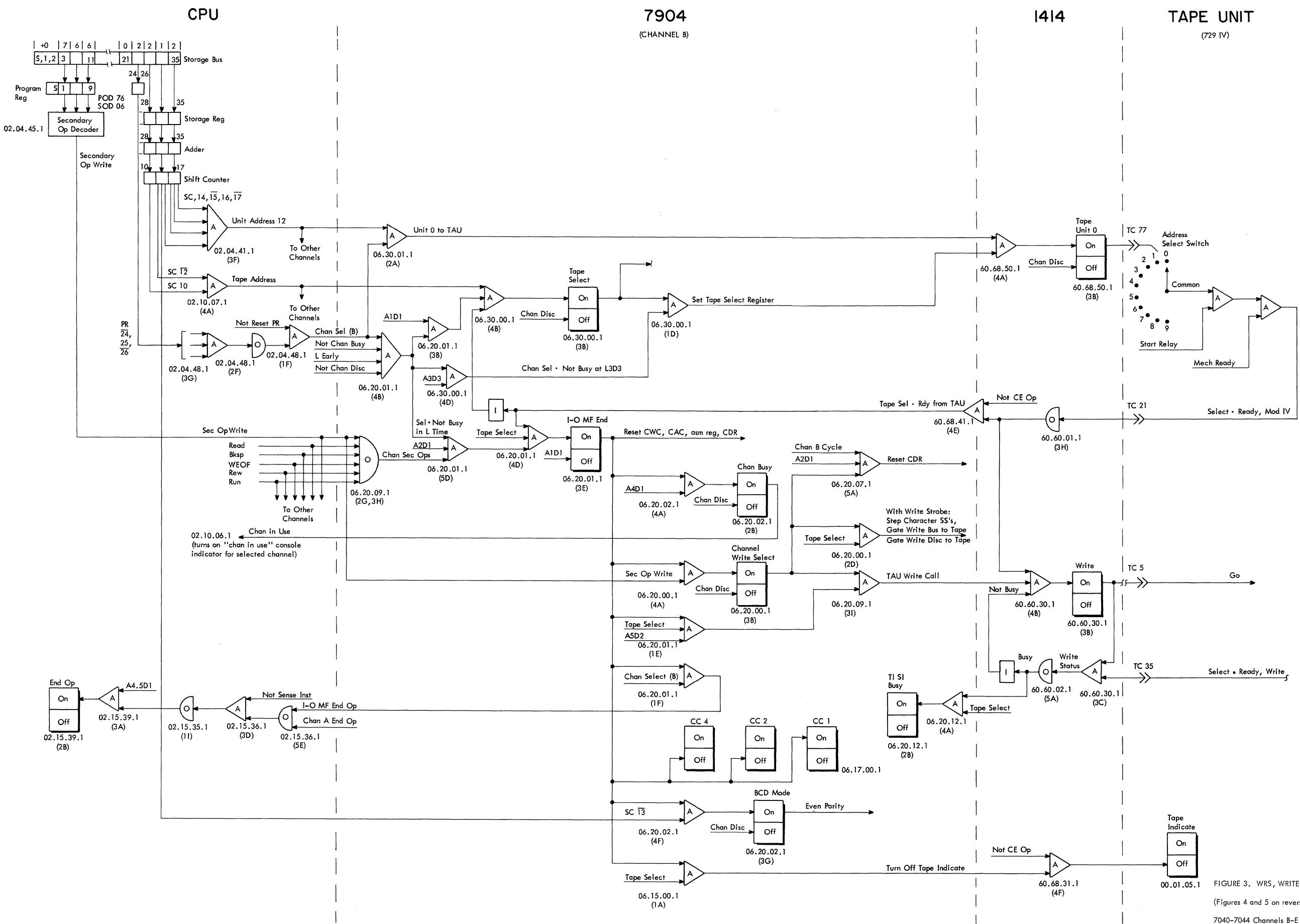


FIGURE 3. WRS, WRITE TAPE OPERATION  
(Figures 4 and 5 on reverse)

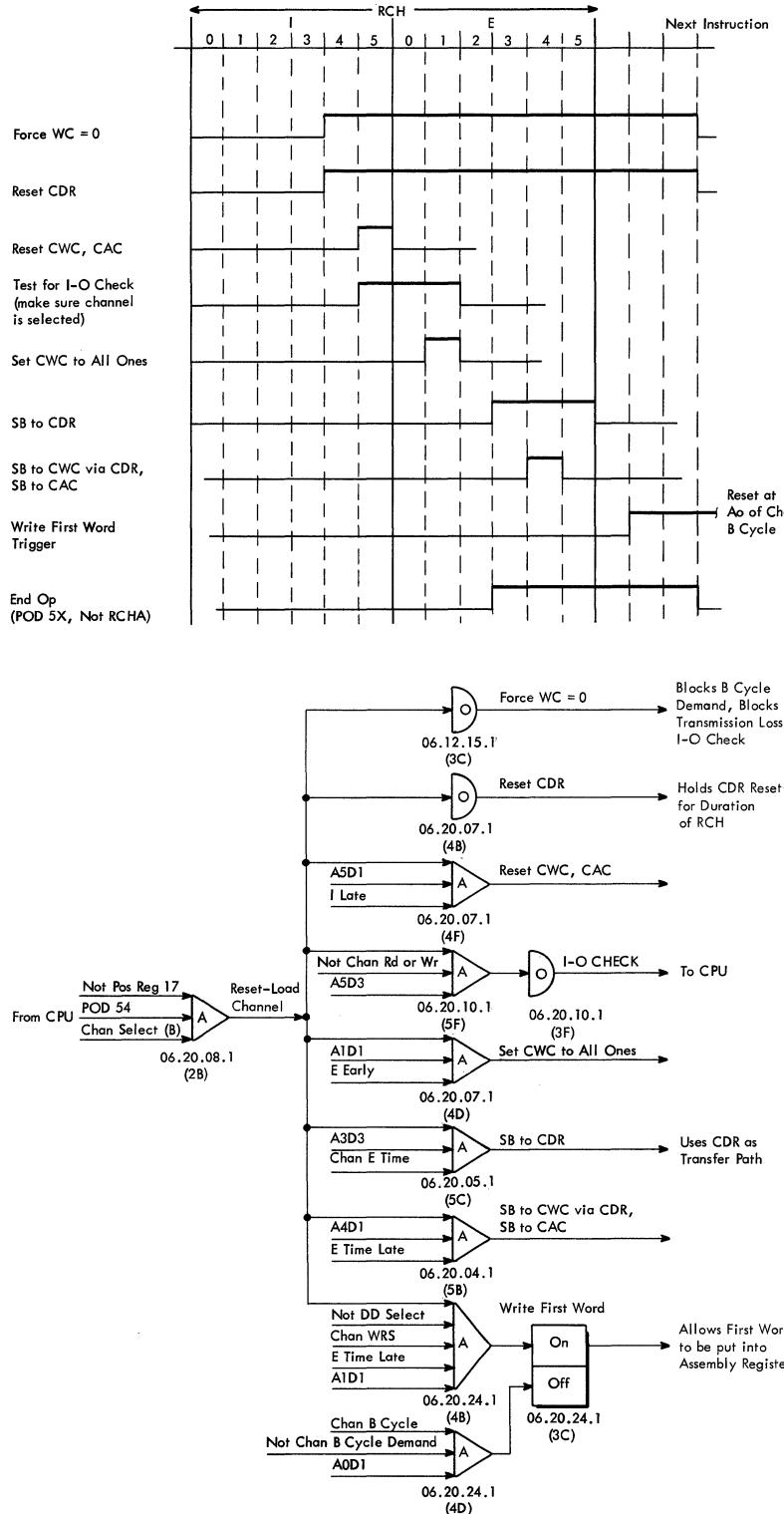


FIGURE 4. RCH, WRITE TAPE OPERATION

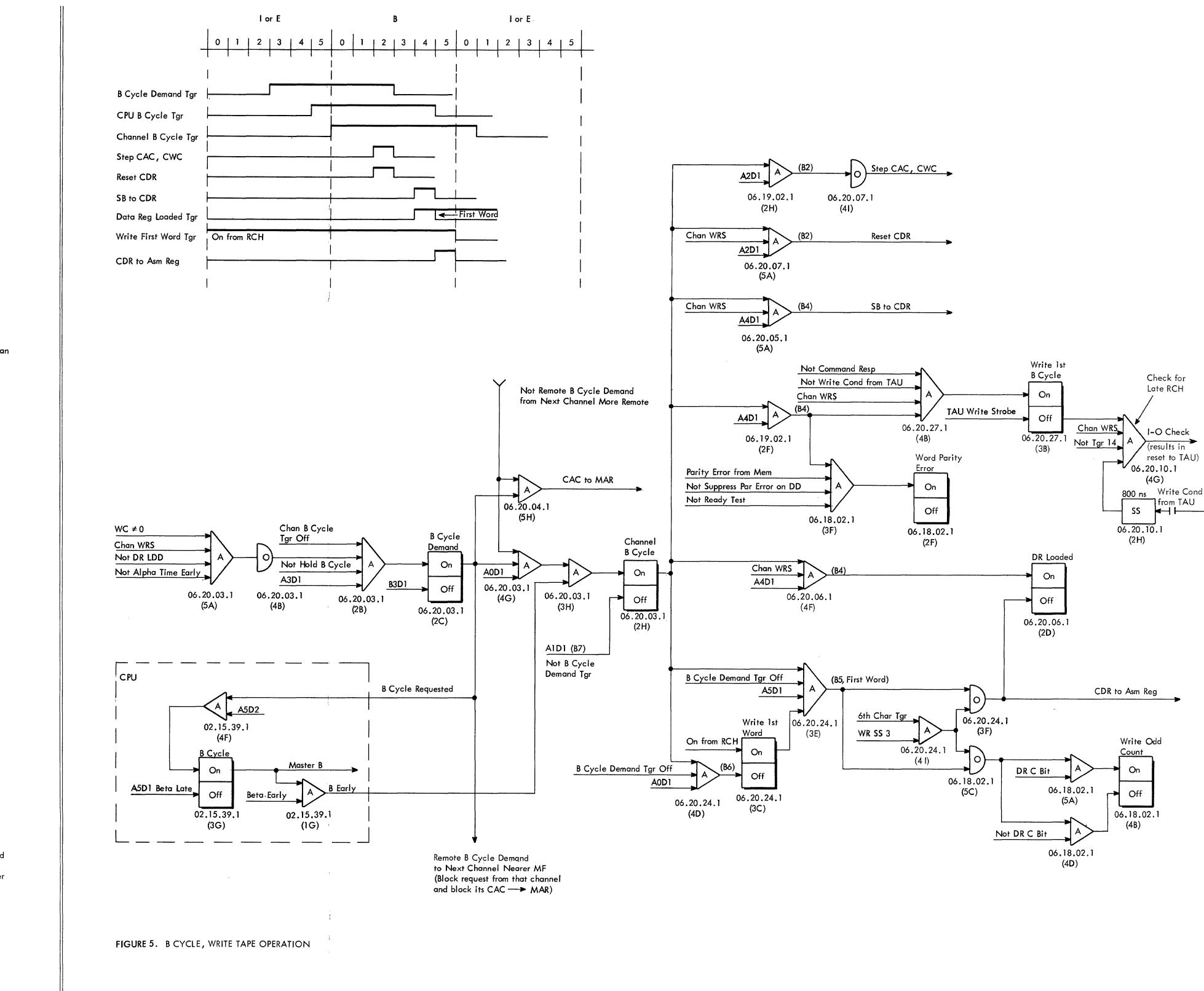


FIGURE 4. RCH, WRITE TAPE OPERATION

FIGURE 5. B CYCLE, WRITE TAPE OPERATION

(Figure 3 on reverse)

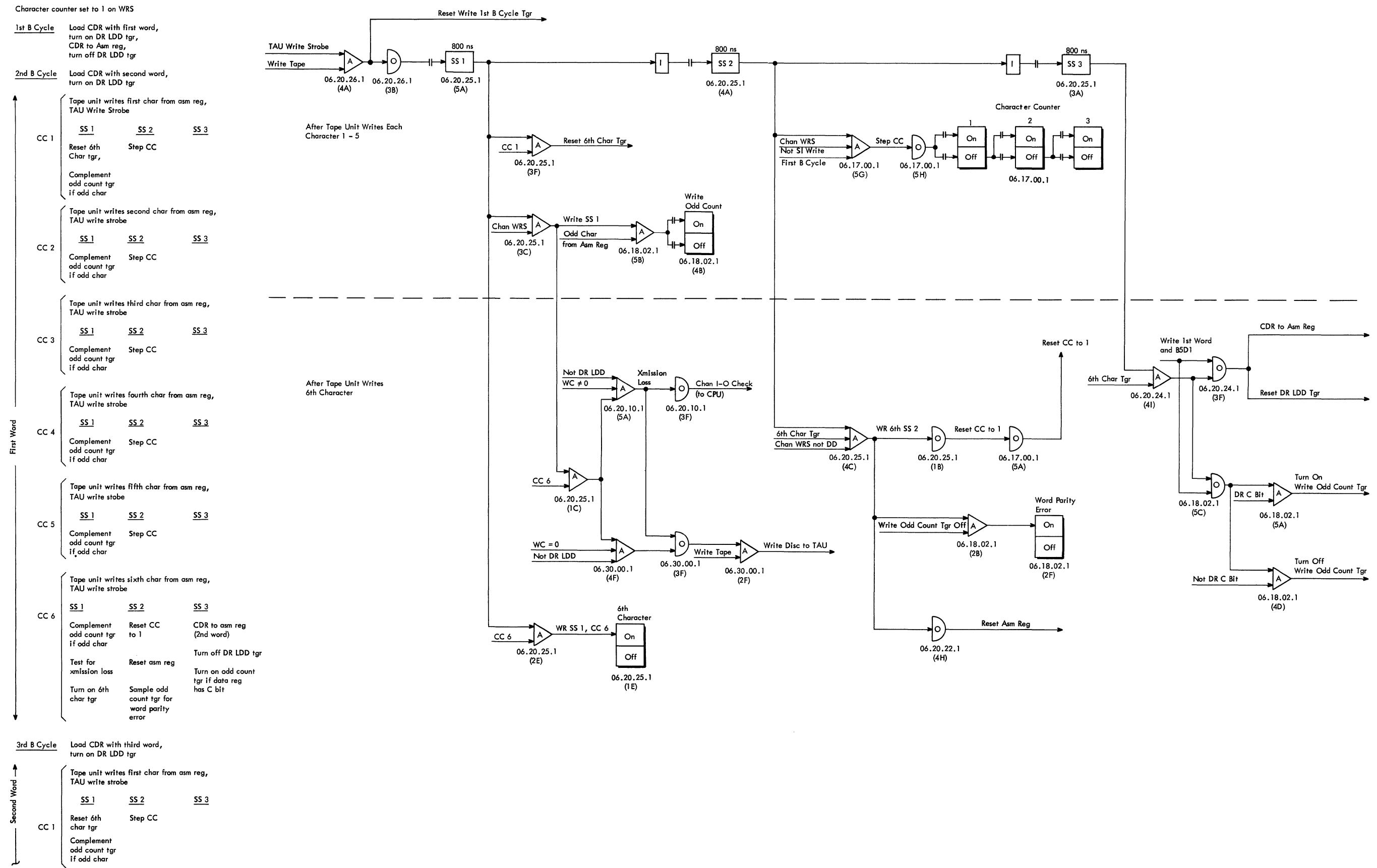
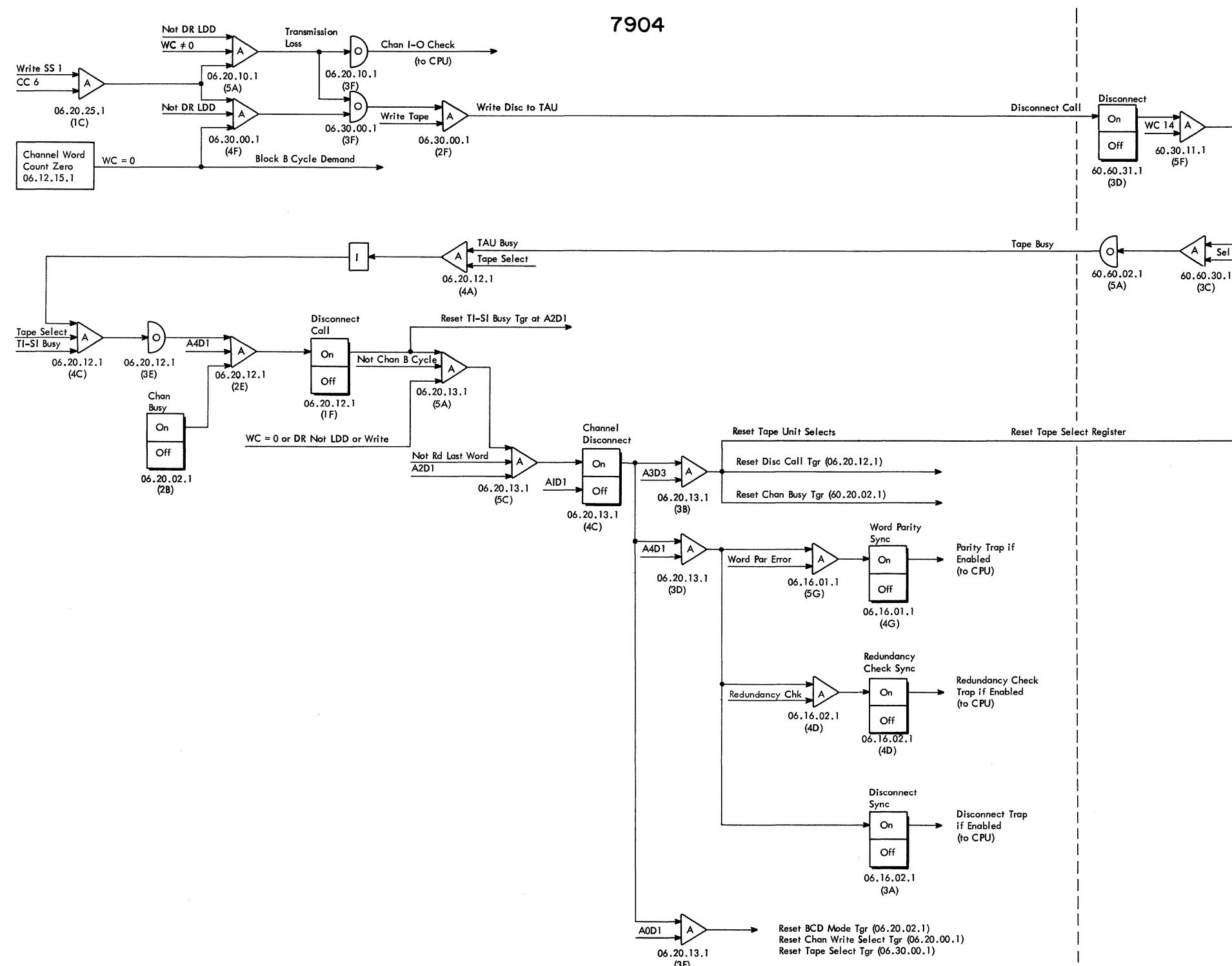


FIGURE 6. CHARACTER WRITING, WRITE TAPE OPERATION  
 (Figure 7 on reverse)

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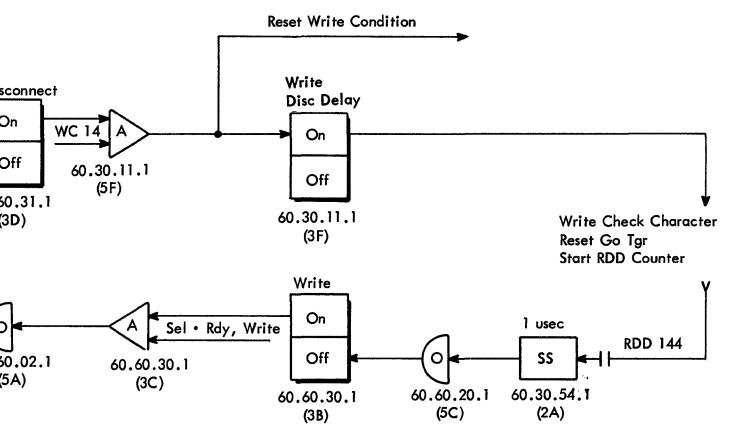


FIGURE 7. END OPERATION AND DISCONNECT, WRITE TAPE OPERATION

(Figure 6 on reverse)

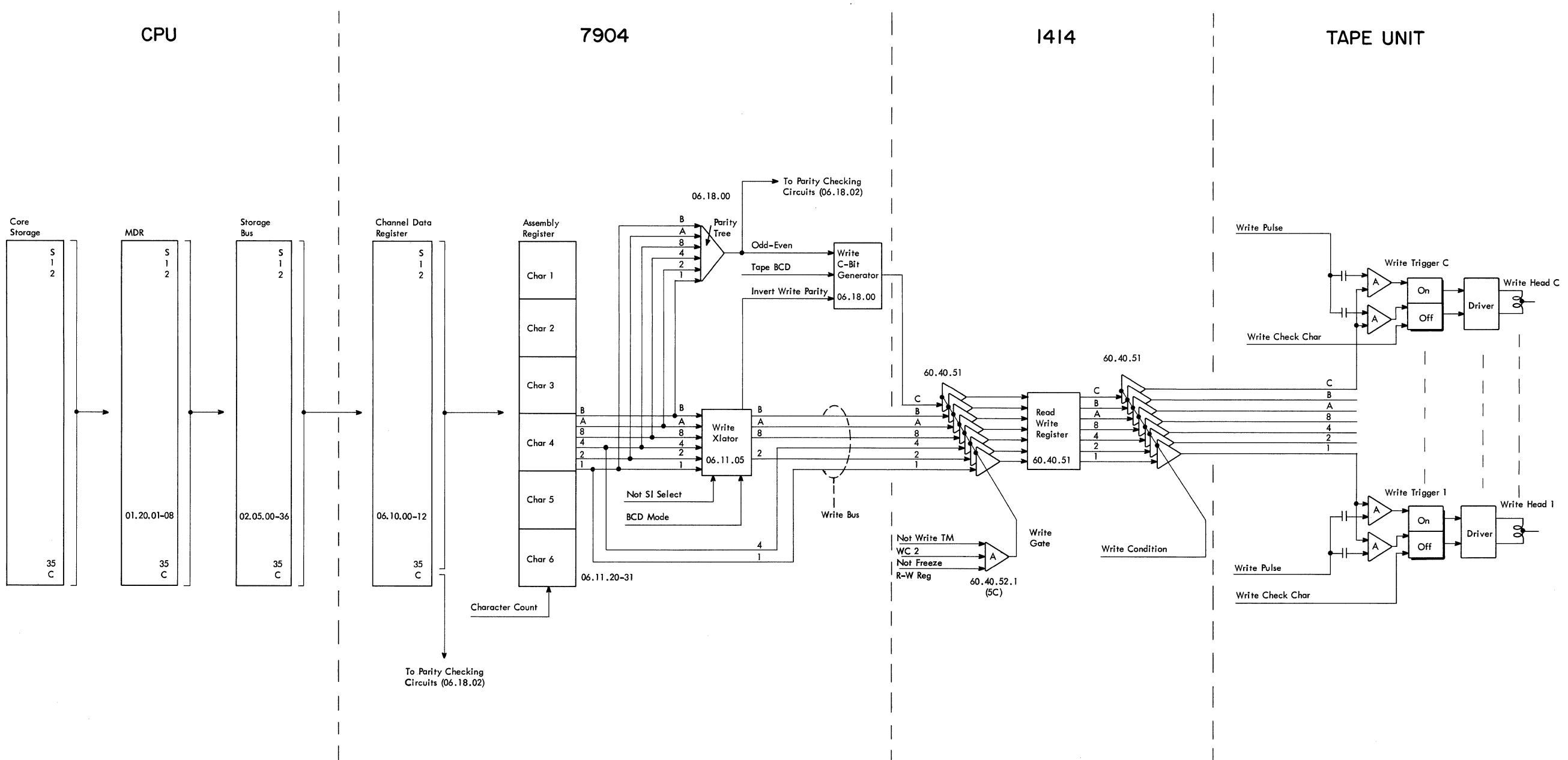


FIGURE 8. DATA FLOW, WRITE TAPE OPERATION  
(Figure 9 on reverse)

CPU

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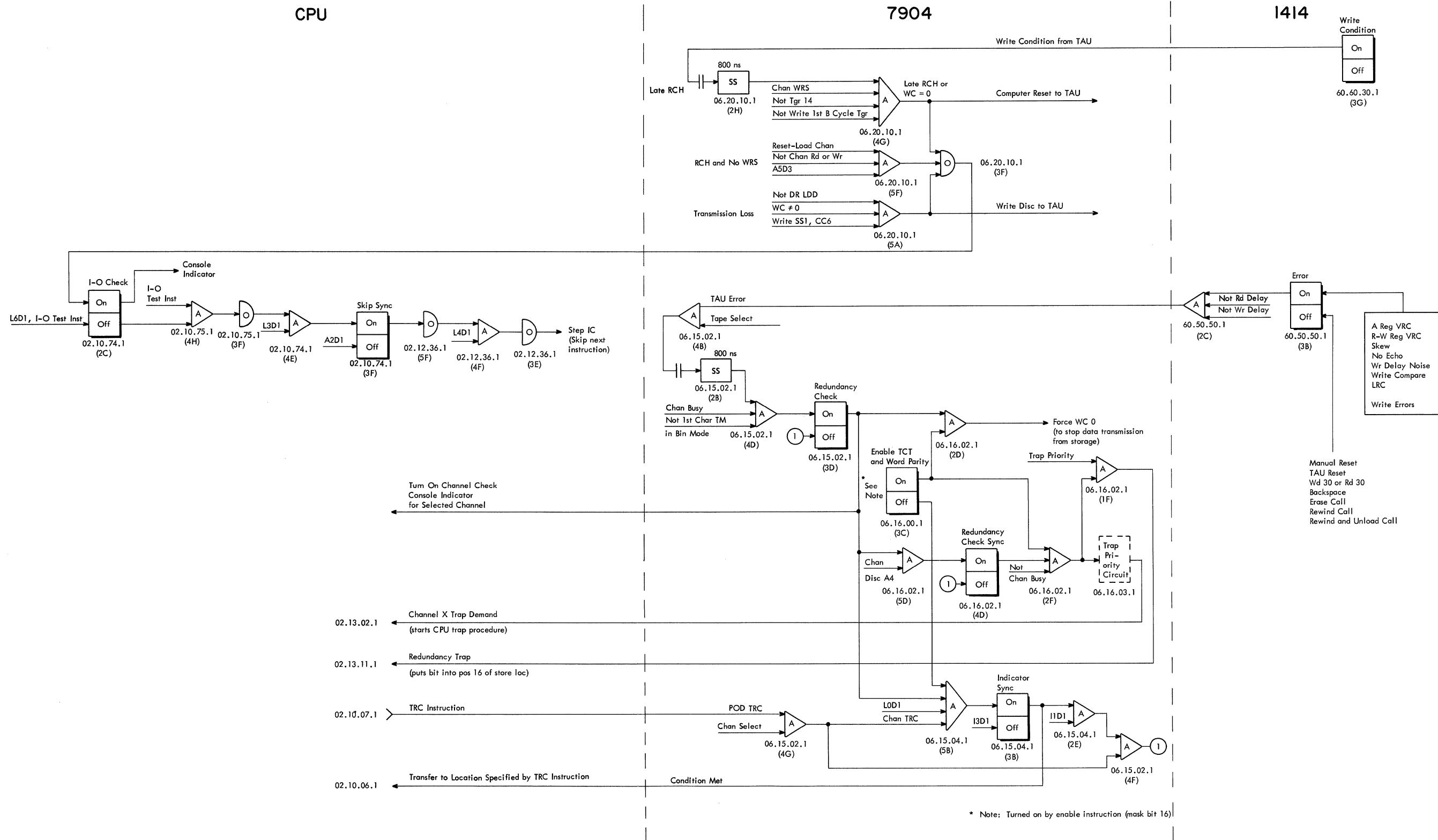


FIGURE 9. I-O CHECK AND REDUNDANCY CHECK, WRITE TAPE OPERATION

(Figure 8 on reverse)

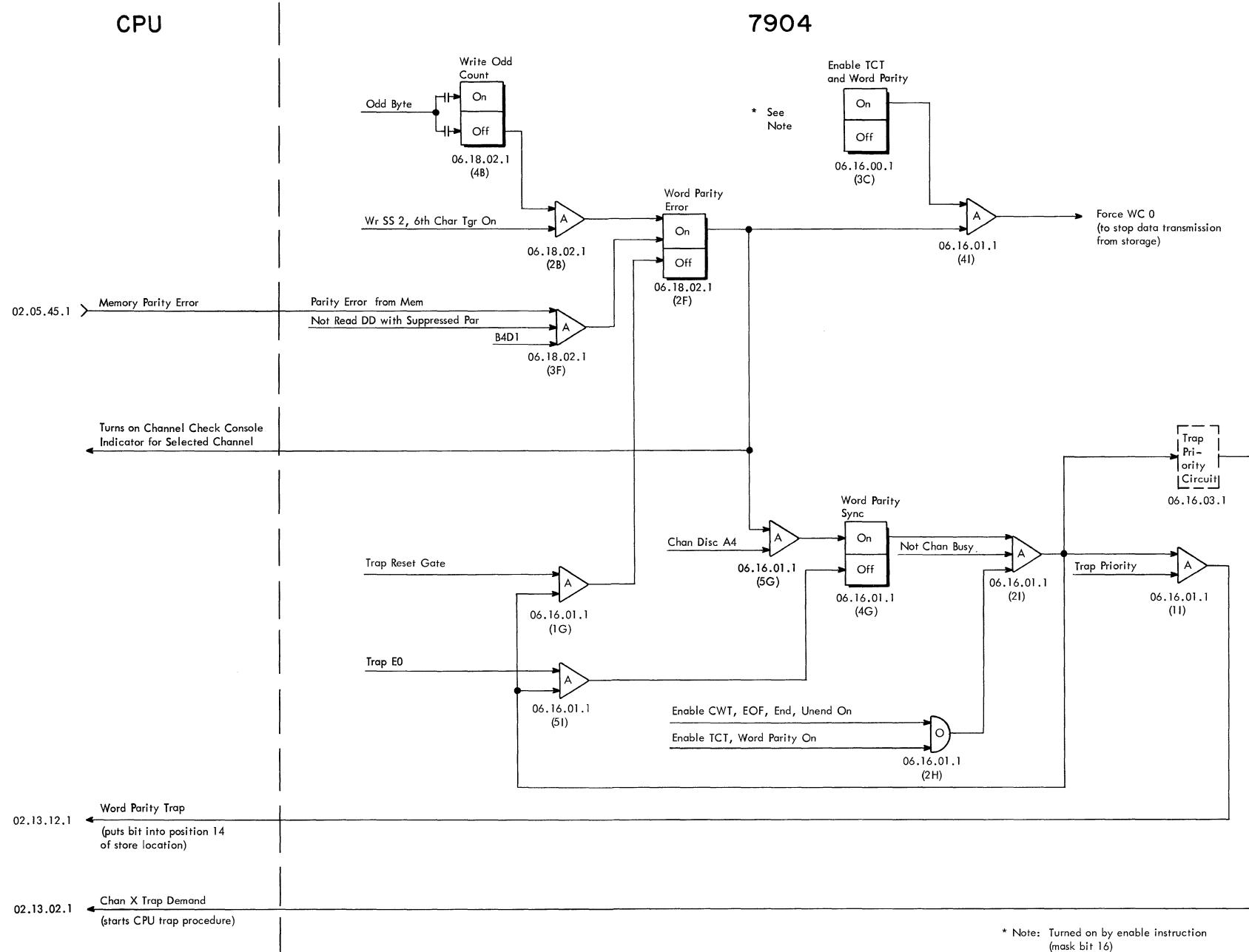
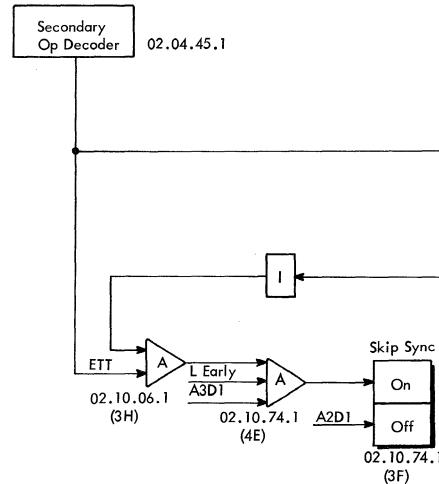
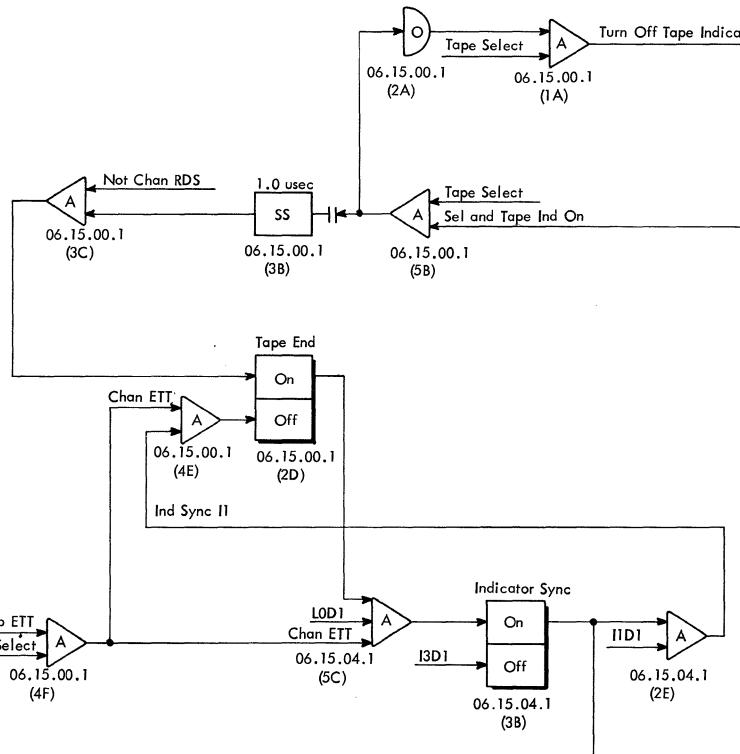


FIGURE 10. WORD PARITY ERROR, WRITE TAPE OPERATION

## CPU

Note: If ETT instruction is executed with tape end trigger on, tape end trigger is turned off and program does not skip.

If ETT instruction is executed with tape end trigger off, program skips the next instruction.

7904  
(CHANNEL B)

## 1414

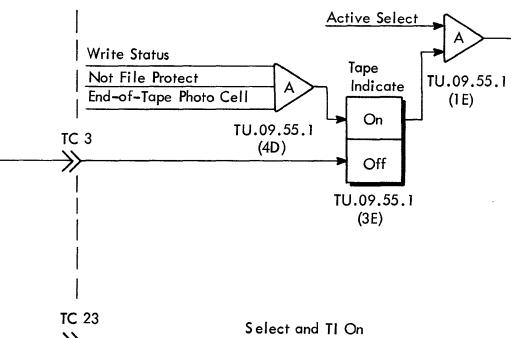
TAPE UNIT  
(729 IV)

FIGURE 11. ETT, END-OF-TAPE OPERATION

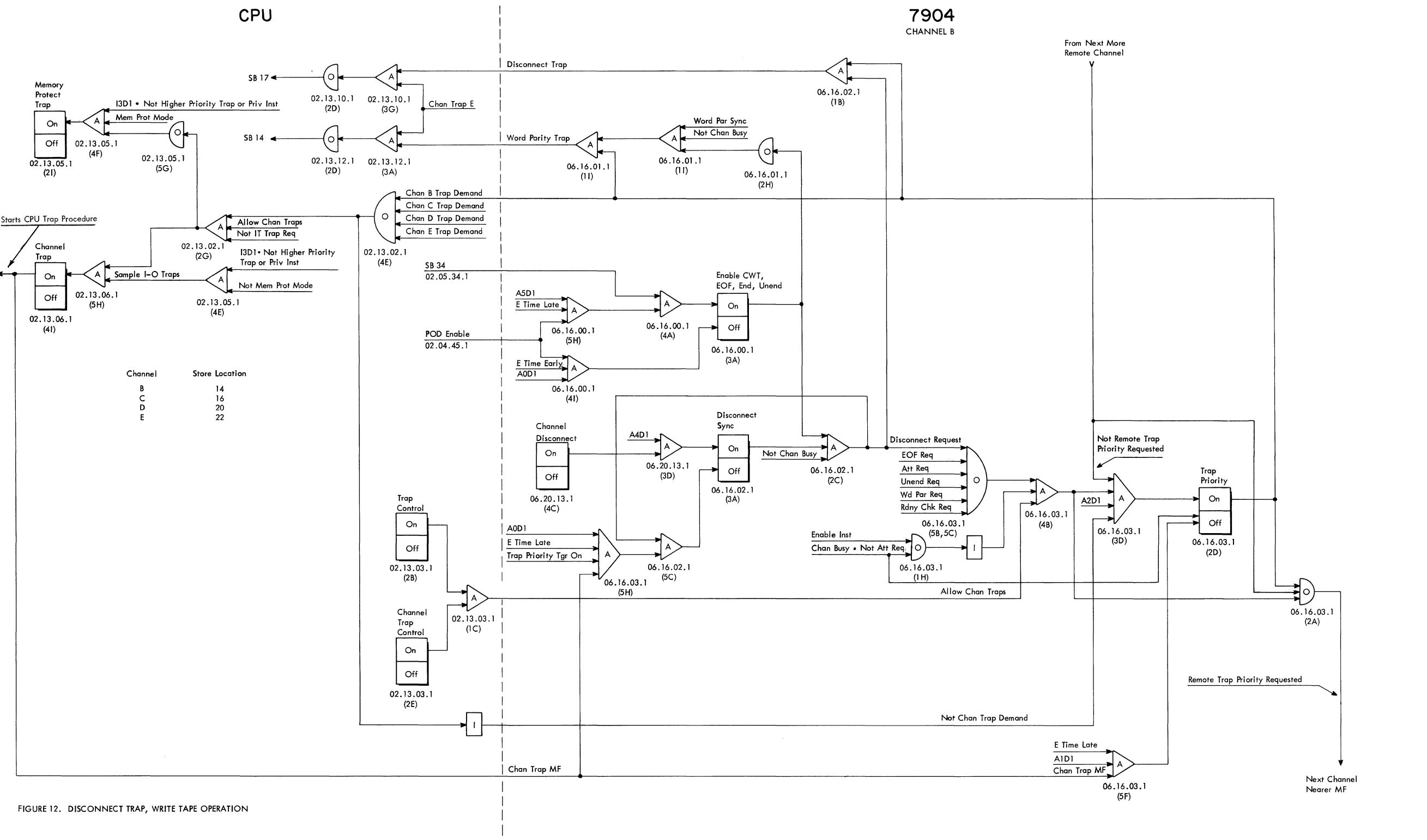


FIGURE 12. DISCONNECT TRAP, WRITE TAPE OPERATION

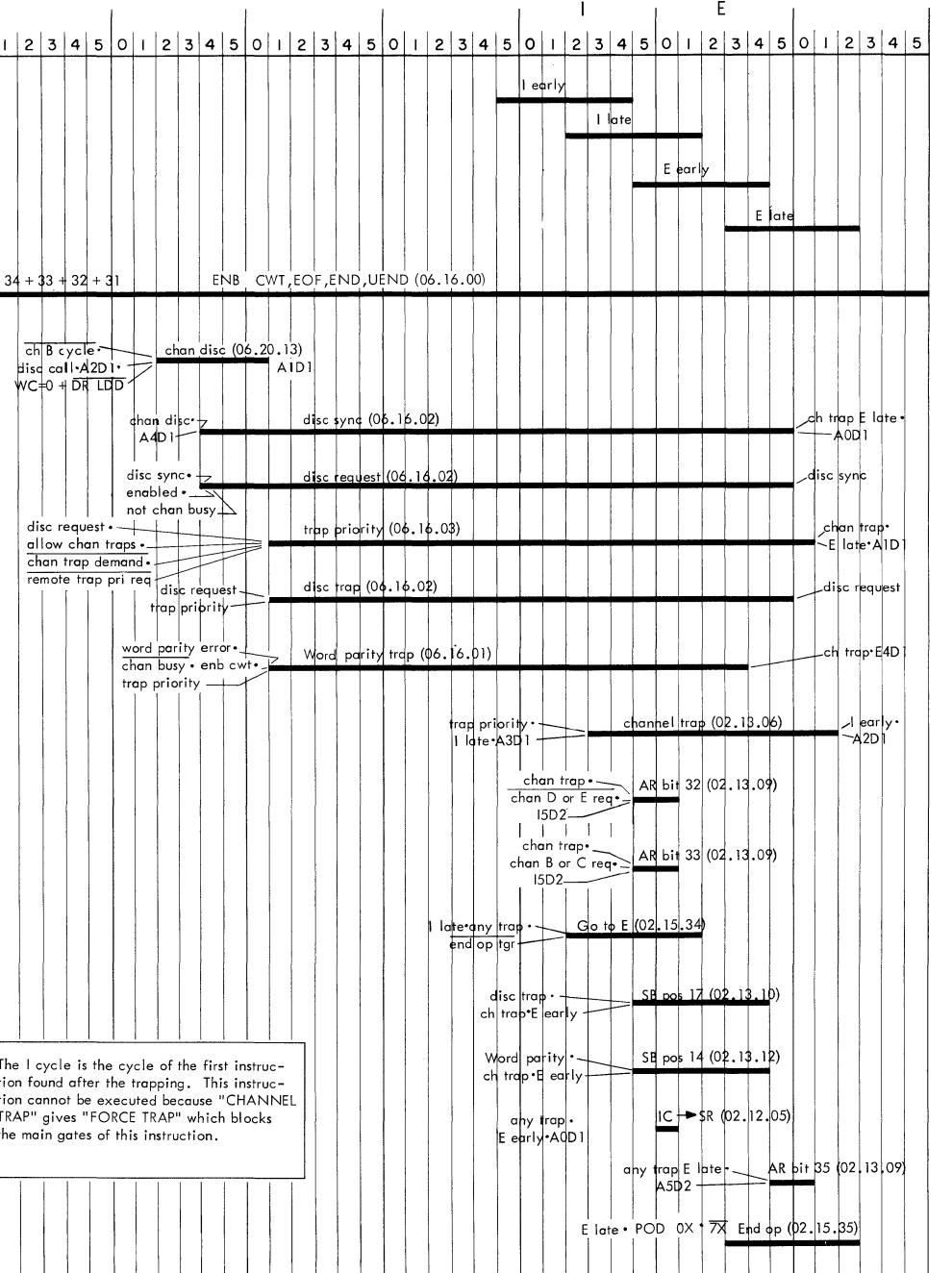


FIGURE 13. DISCONNECT TRAP TIMING

#### RE 12. DISCONNECT TRAP, WRITE TAPE OPERATION RE 13. DISCONNECT TRAP TIMING

(and 15 on reverse)

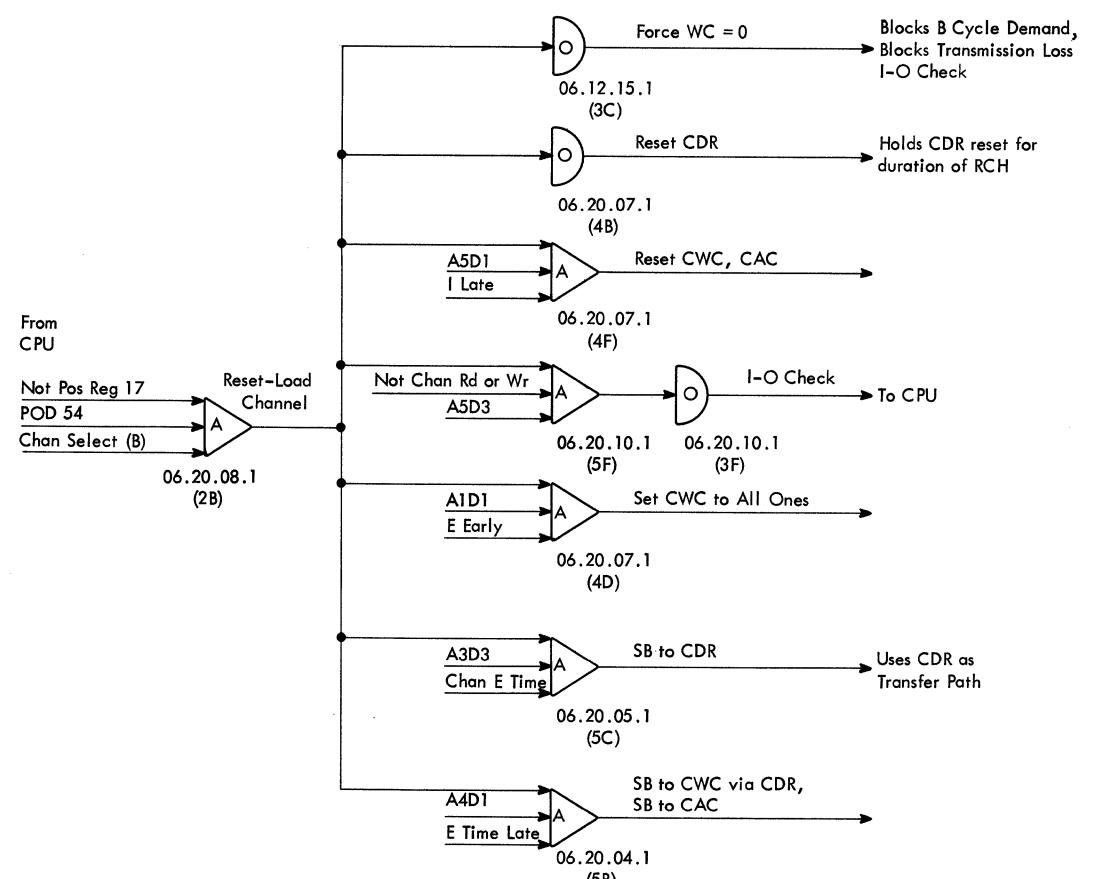
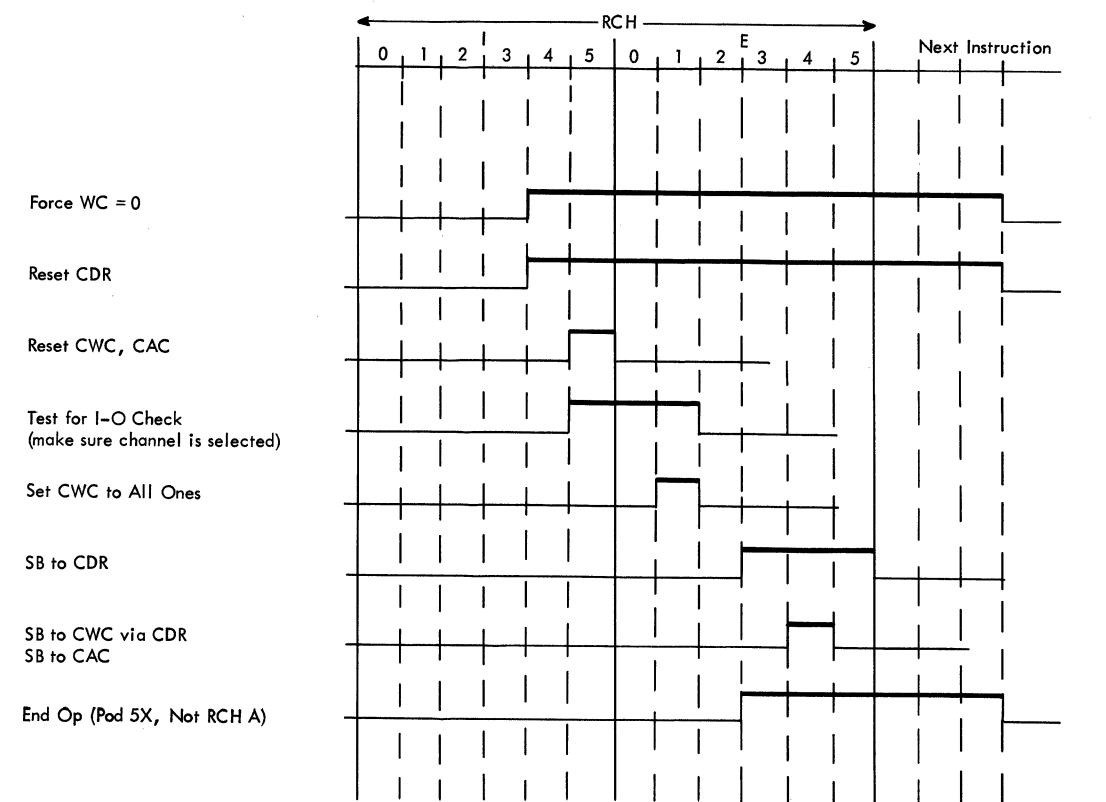
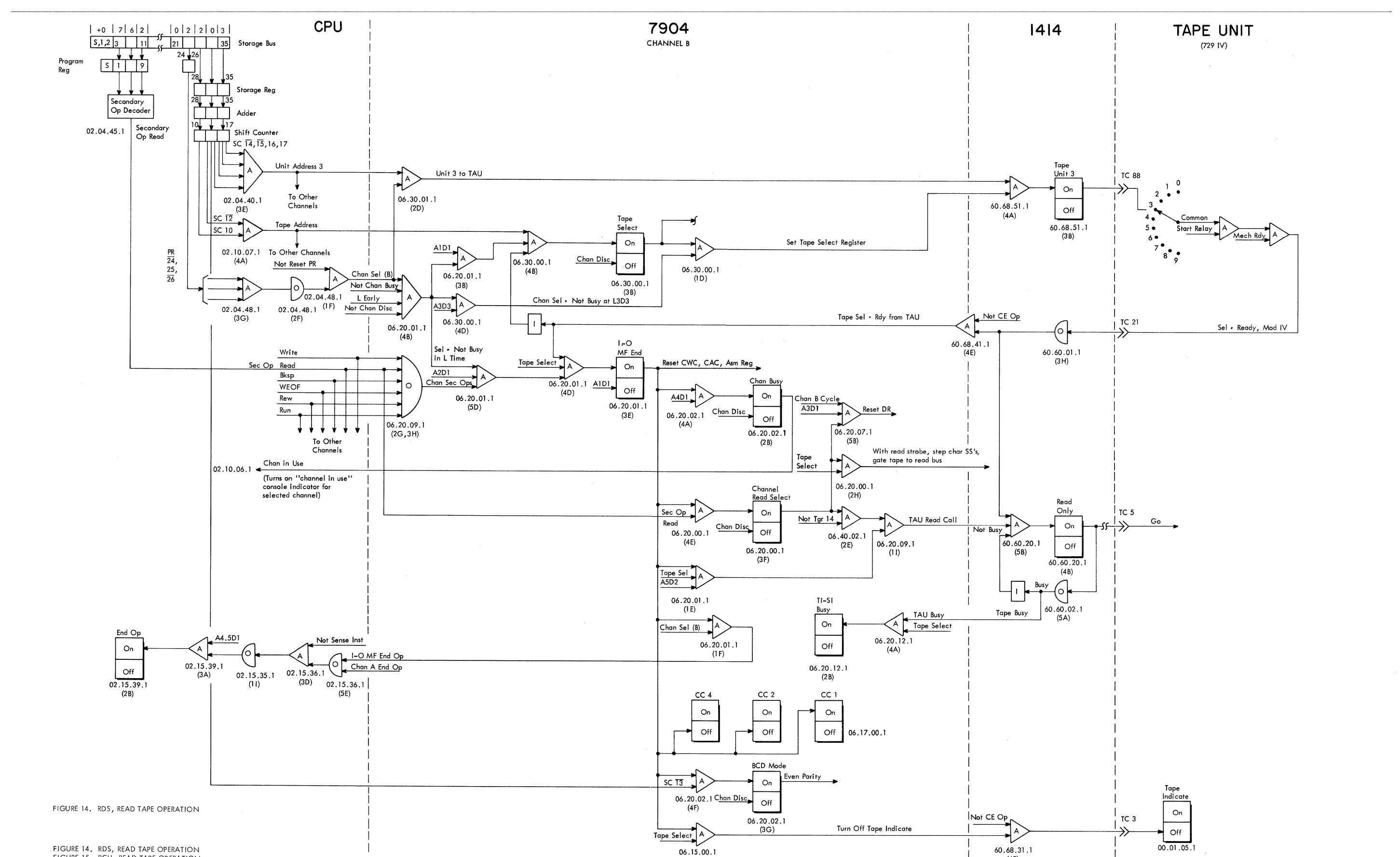


FIGURE 15. RCH, READ TAPE OPERATION

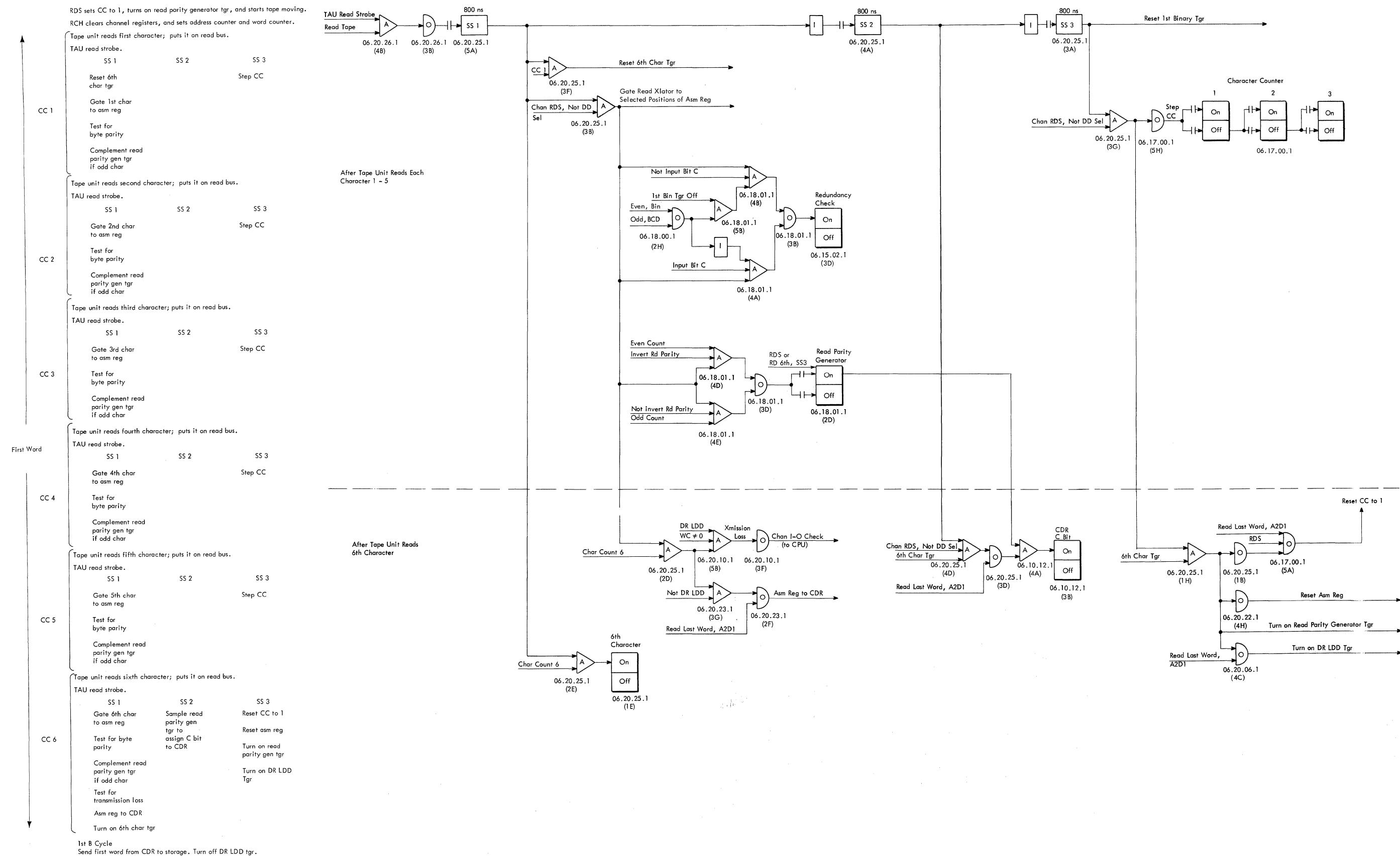


FIGURE 16. CHARACTER READING, READ TAPE OPERATION

(Figure 17 on reverse)

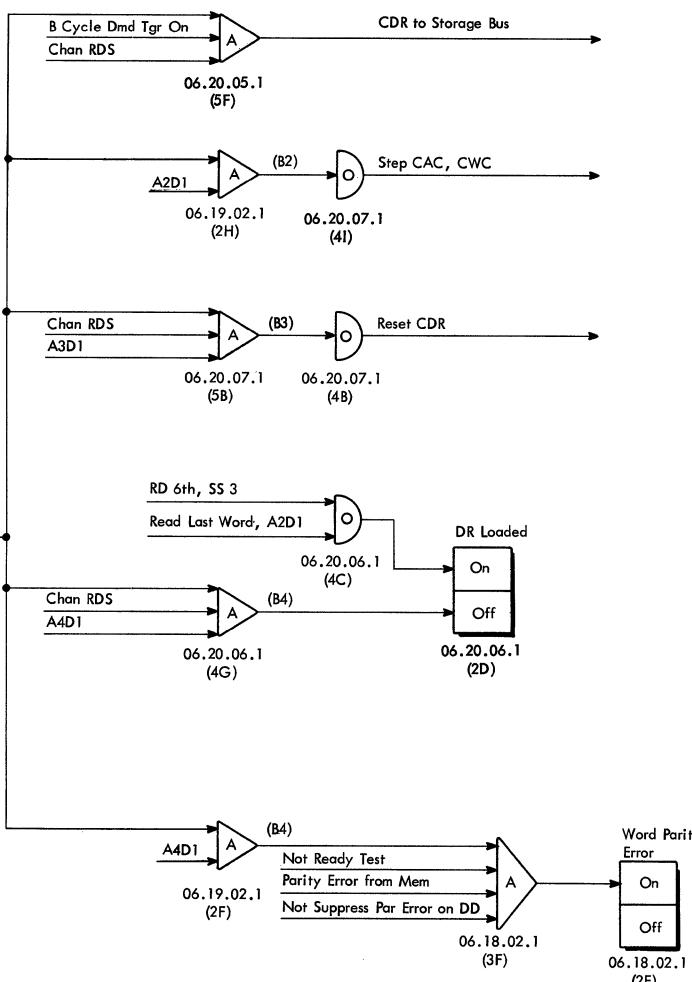
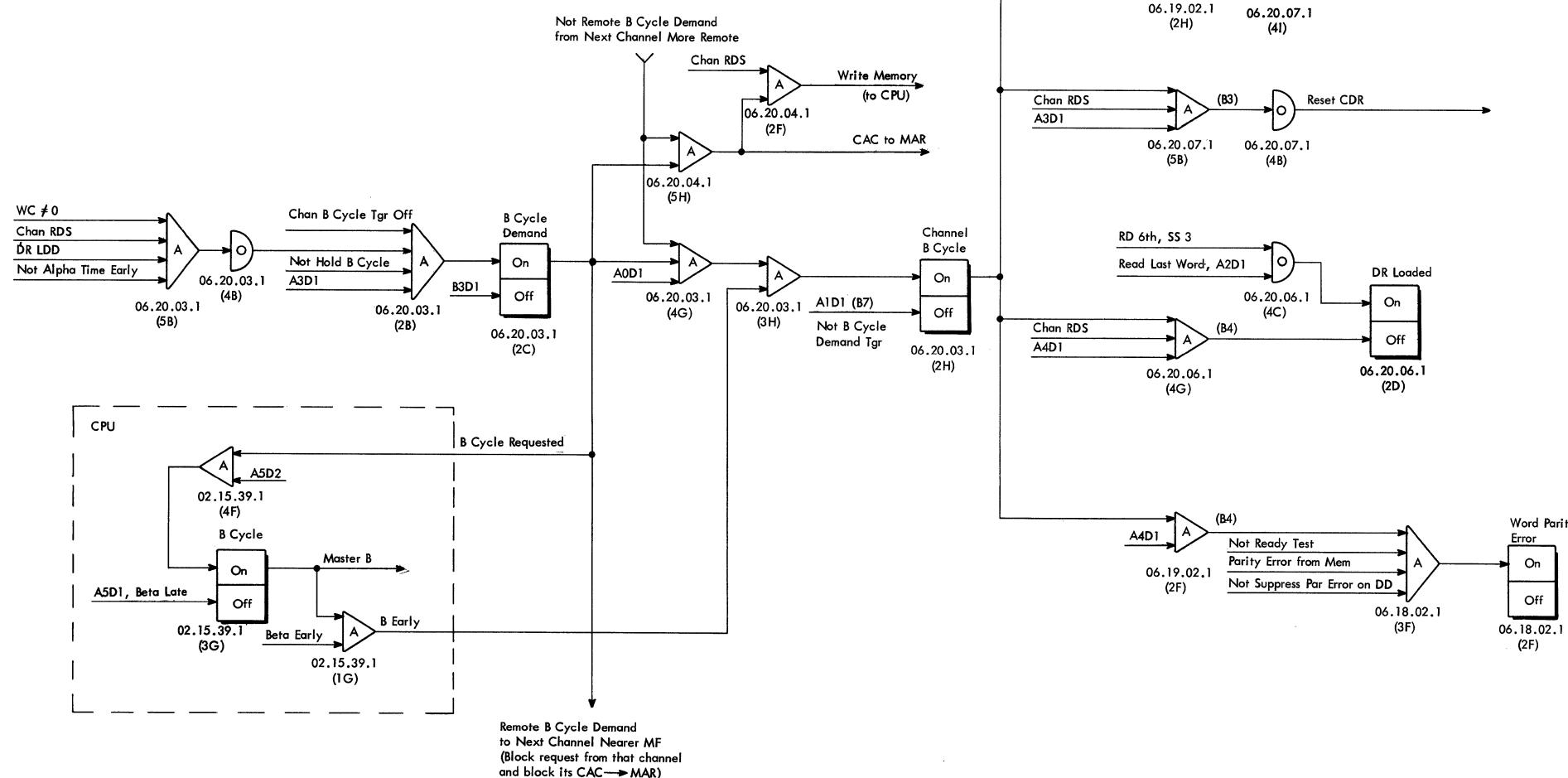
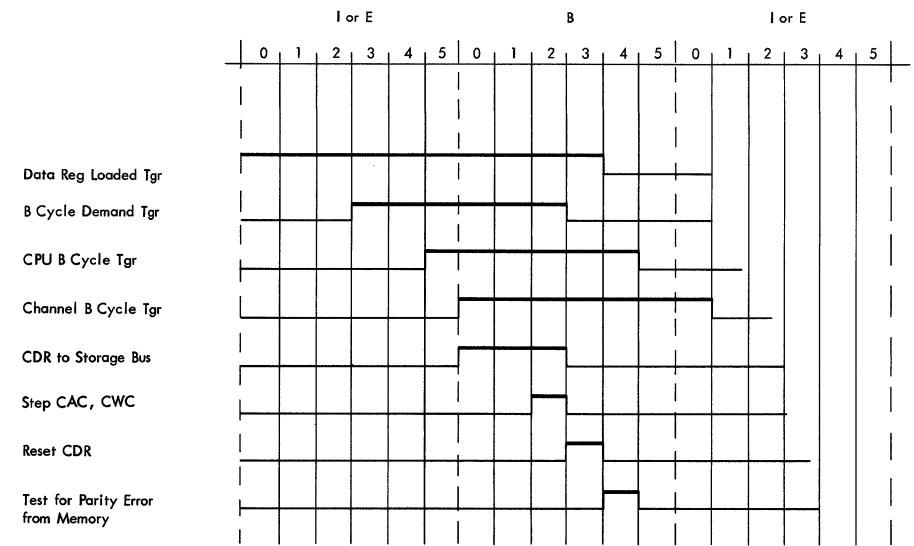


FIGURE 17. B CYCLE, READ TAPE OPERATION

(Figure 16 on reverse)

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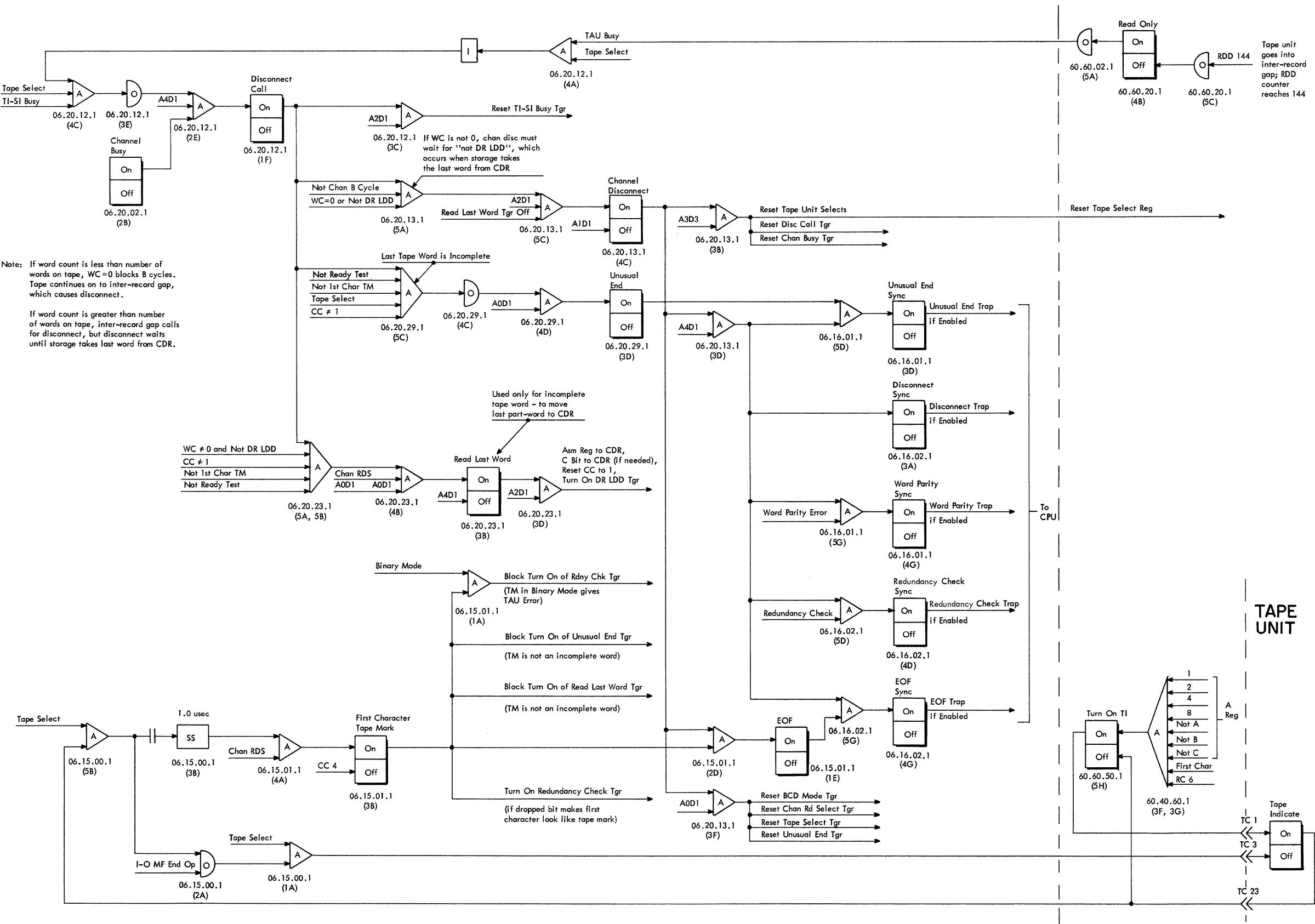
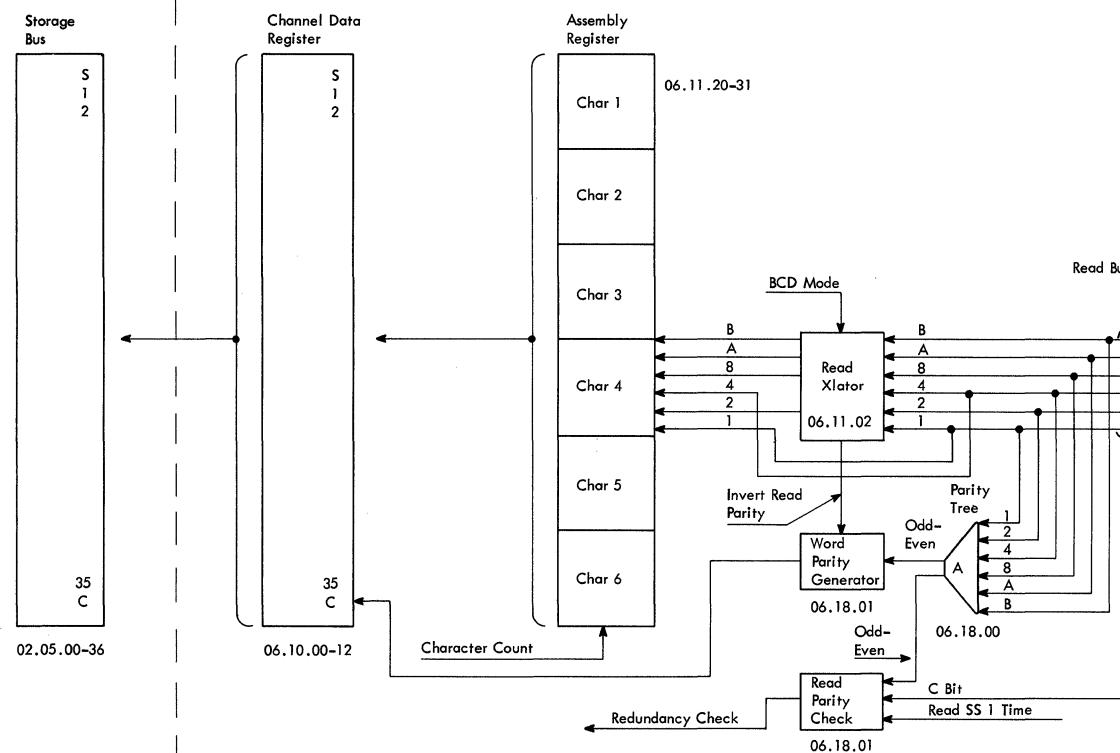


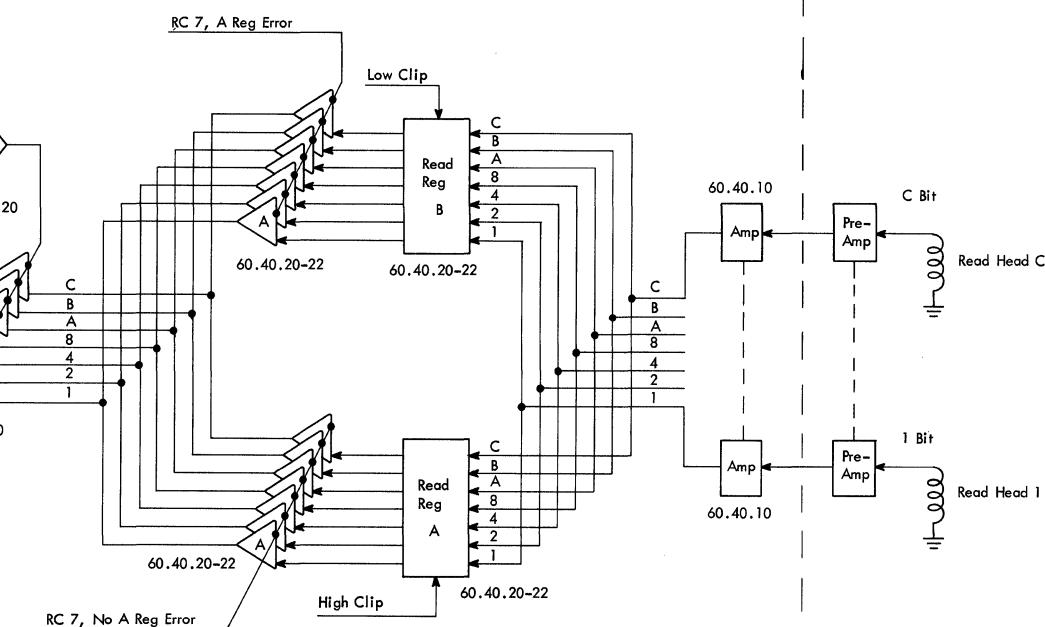
FIGURE 18. END OPERATION AND DISCONNECT, READ TAPE OPERATION  
(Figure 19 on reverse)

CPU

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TAPE UNIT

FIGURE 19. DATA FLOW, READ TAPE OPERATION

(Figure 18 on reverse)

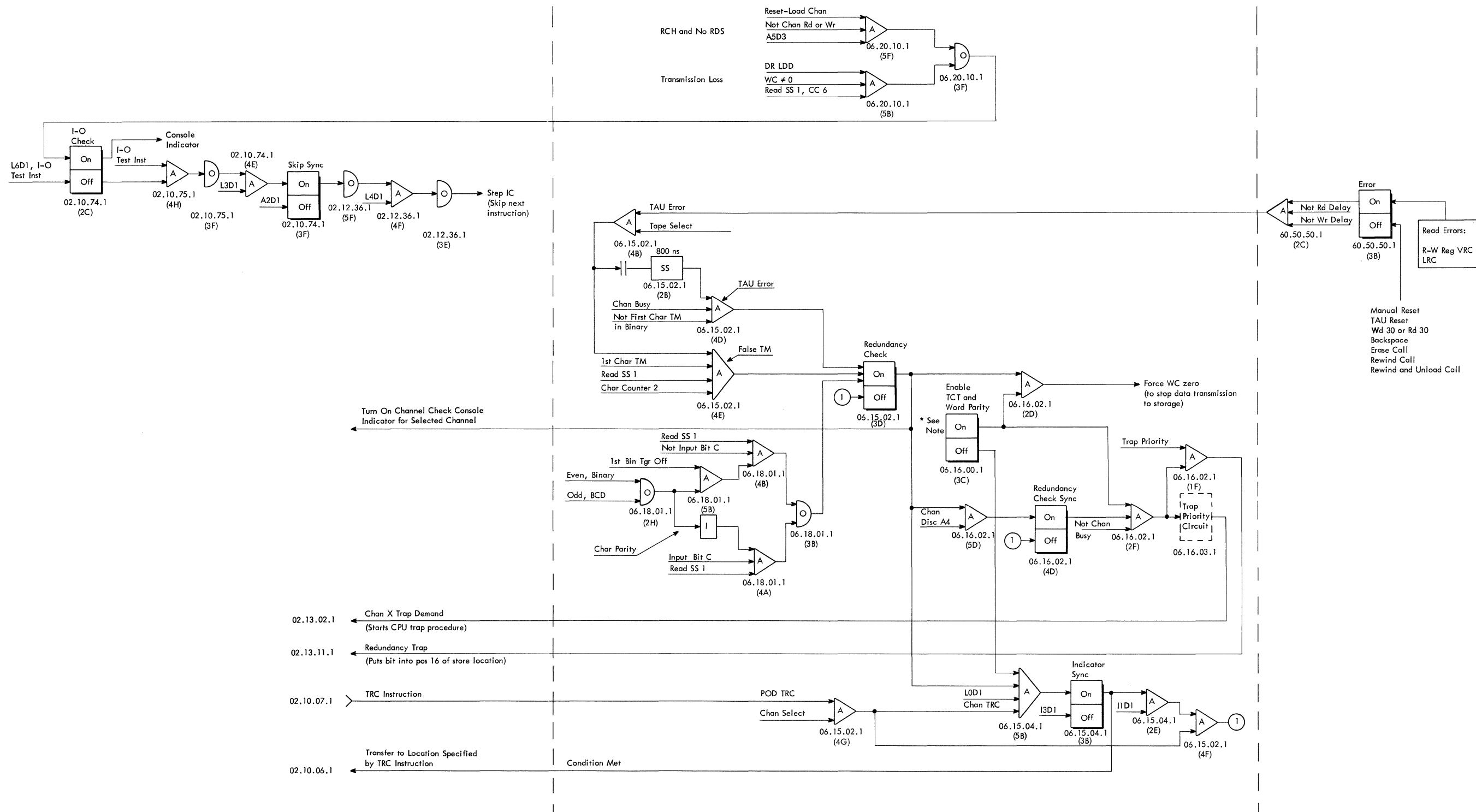
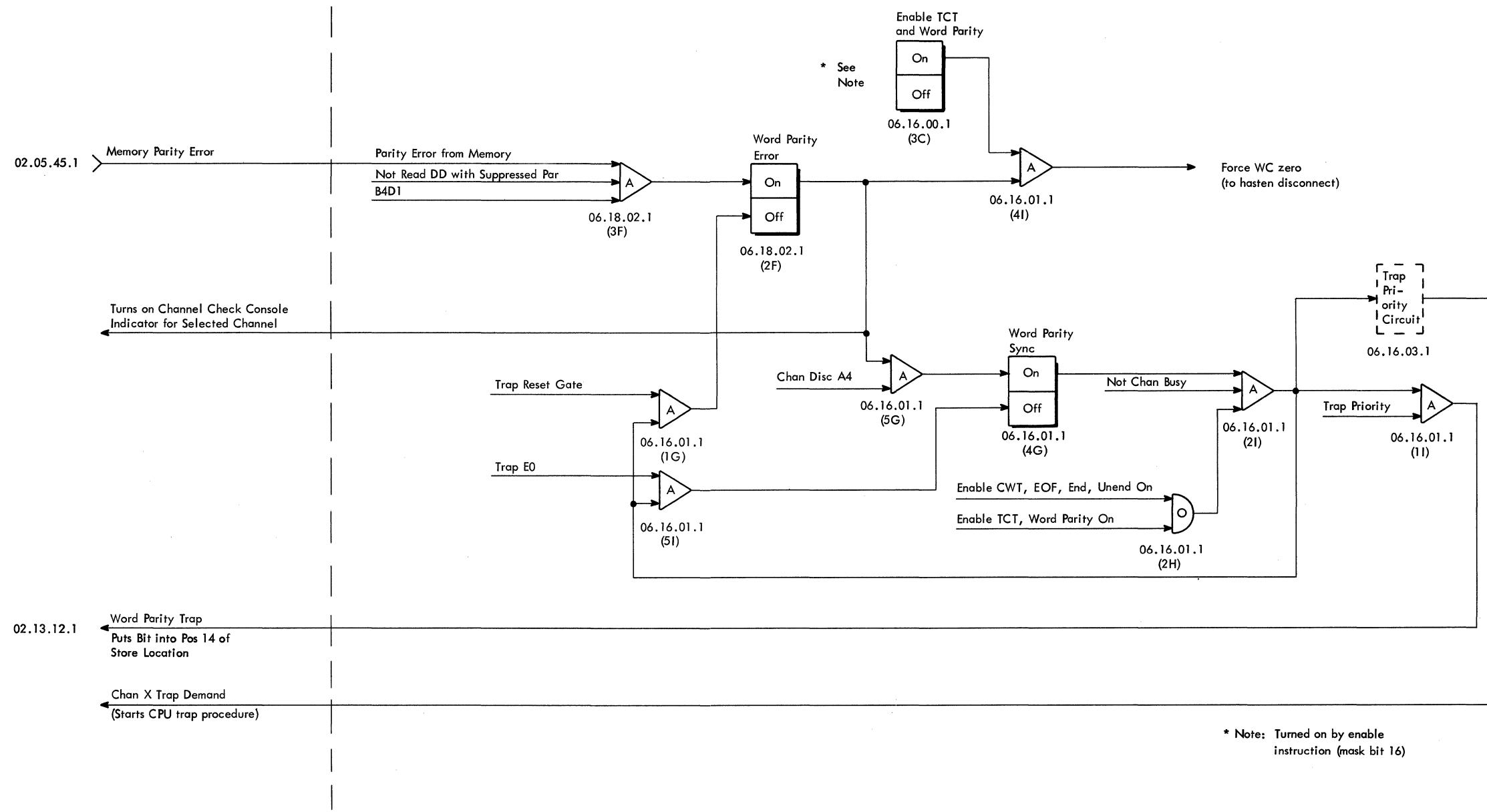


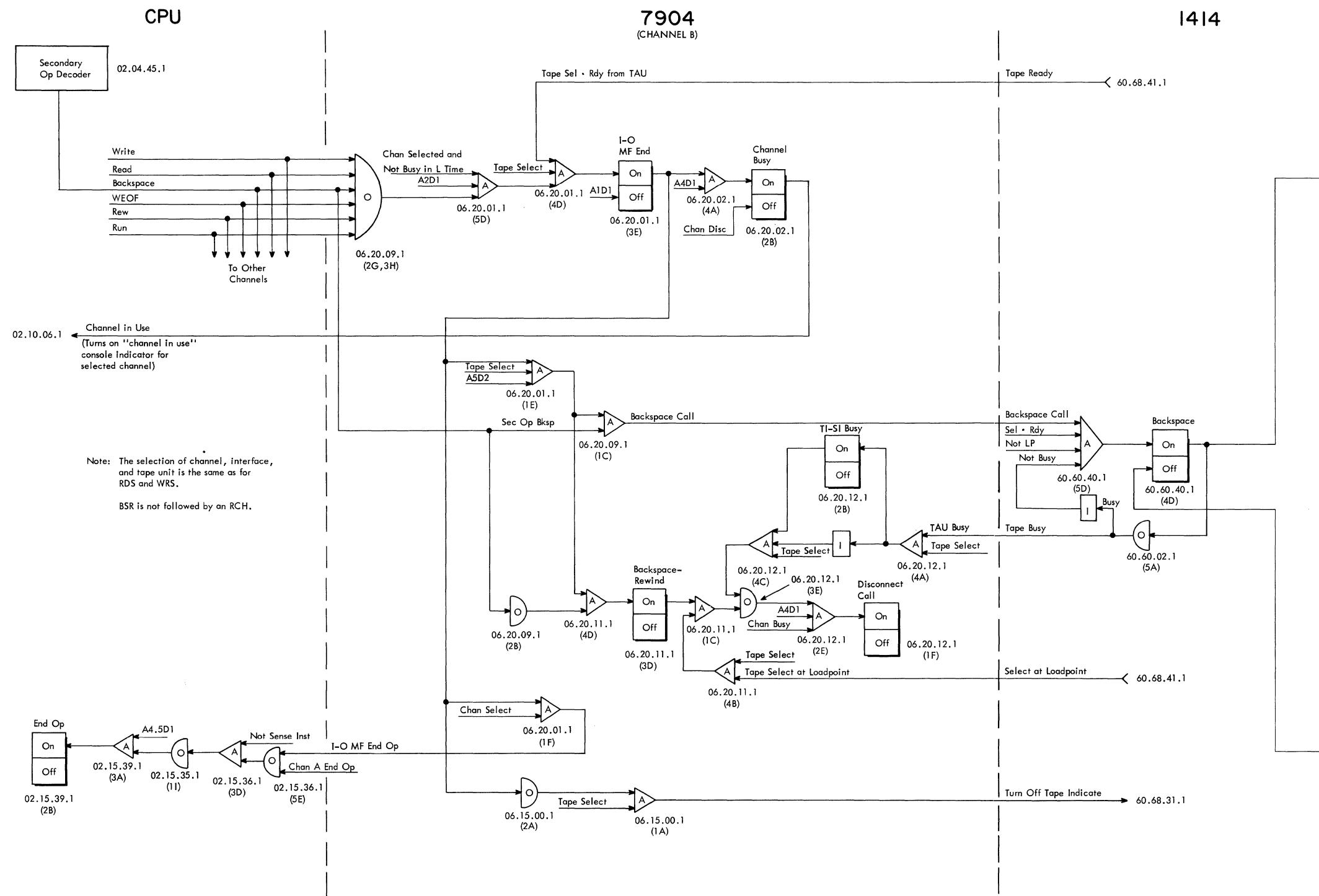
FIGURE 20. I-O CHECK AND REDUNDANCY CHECK, READ TAPE OPERATION  
(Figure 21 on reverse)



\* Note: Turned on by enable instruction (mask bit 16)

FIGURE 21. WORD PARITY ERROR, READ TAPE OPERATION

(Figure 20 on reverse)



1. Start delay counter (MS mode); set Go if in write status.
2. D50 - reset Go (coast to a stop).
3. D96 - set backward tgr (puts tape unit in read status).
4. D160 - set Go, gate on final amps.
5. D180 - set read condition (gates A and B regs).
6. Read first character encountered, set first bit tgr, and start the read clock (first character encountered is the check character).
7. RC7 - set RDD tgr and run RDD ctr.
8. Read next character, start read clock, and reset RDD at RC4.
9. RC7 - again set RDD tgr and run RDD ctr.
10. Keep looking for RDD ctr count of 16; if counter reaches 16, all characters have passed read head.
11. RDD16 - reset read condition.
12. RDD22 - reset Go.
13. RDD64 - reset backward tgr.
14. RDD 152 - bring up 144 reset, reset backspace tgr (drops busy).

FIGURE 22. BSR, BACKSPACE OPERATION

(Figure 23 on reverse)

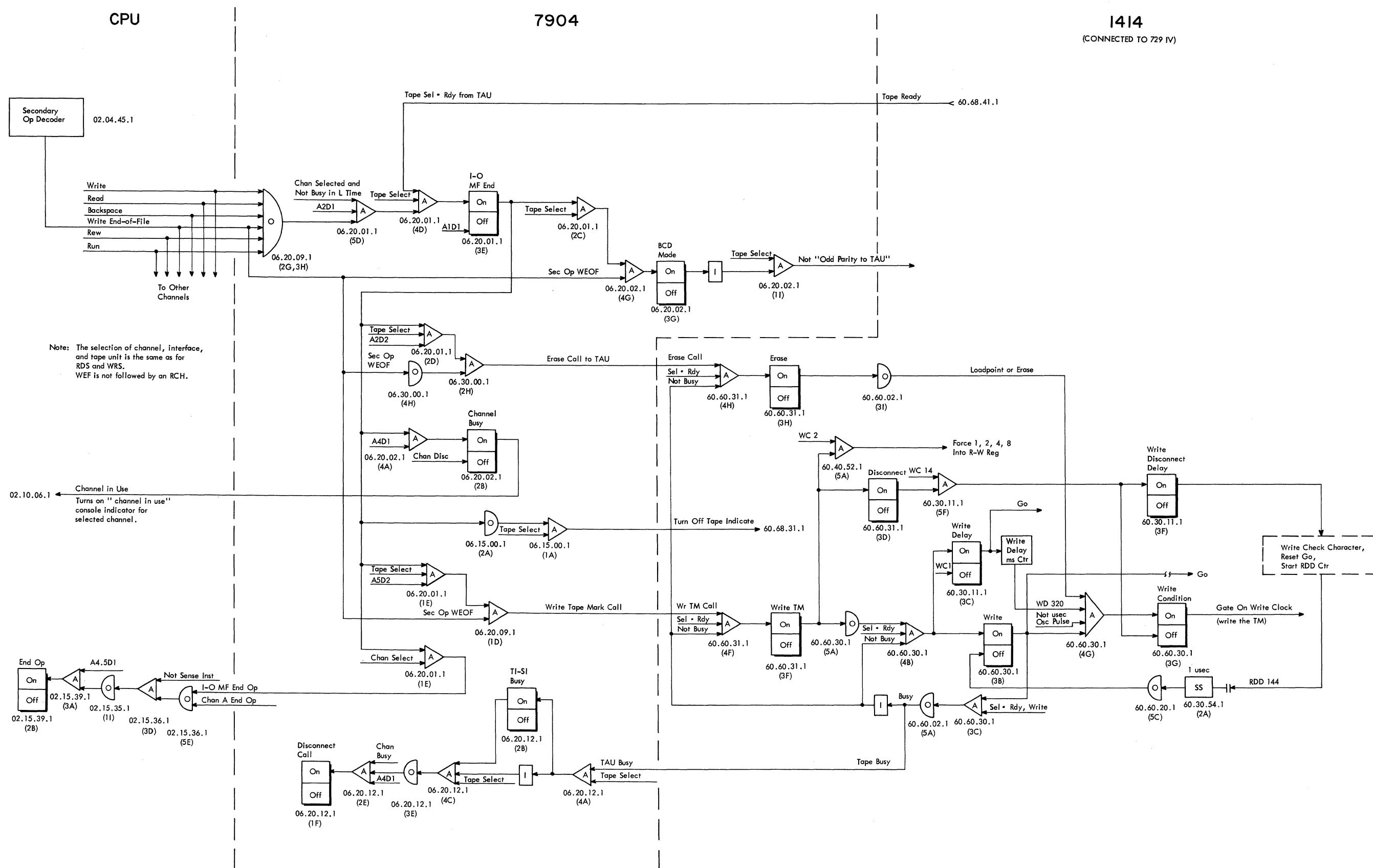


FIGURE 23. WEF, WRITE-END-OF-FILE OPERATIO

(Figure 22 on reverse)

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1414

TAPE UNIT

(729 IV)

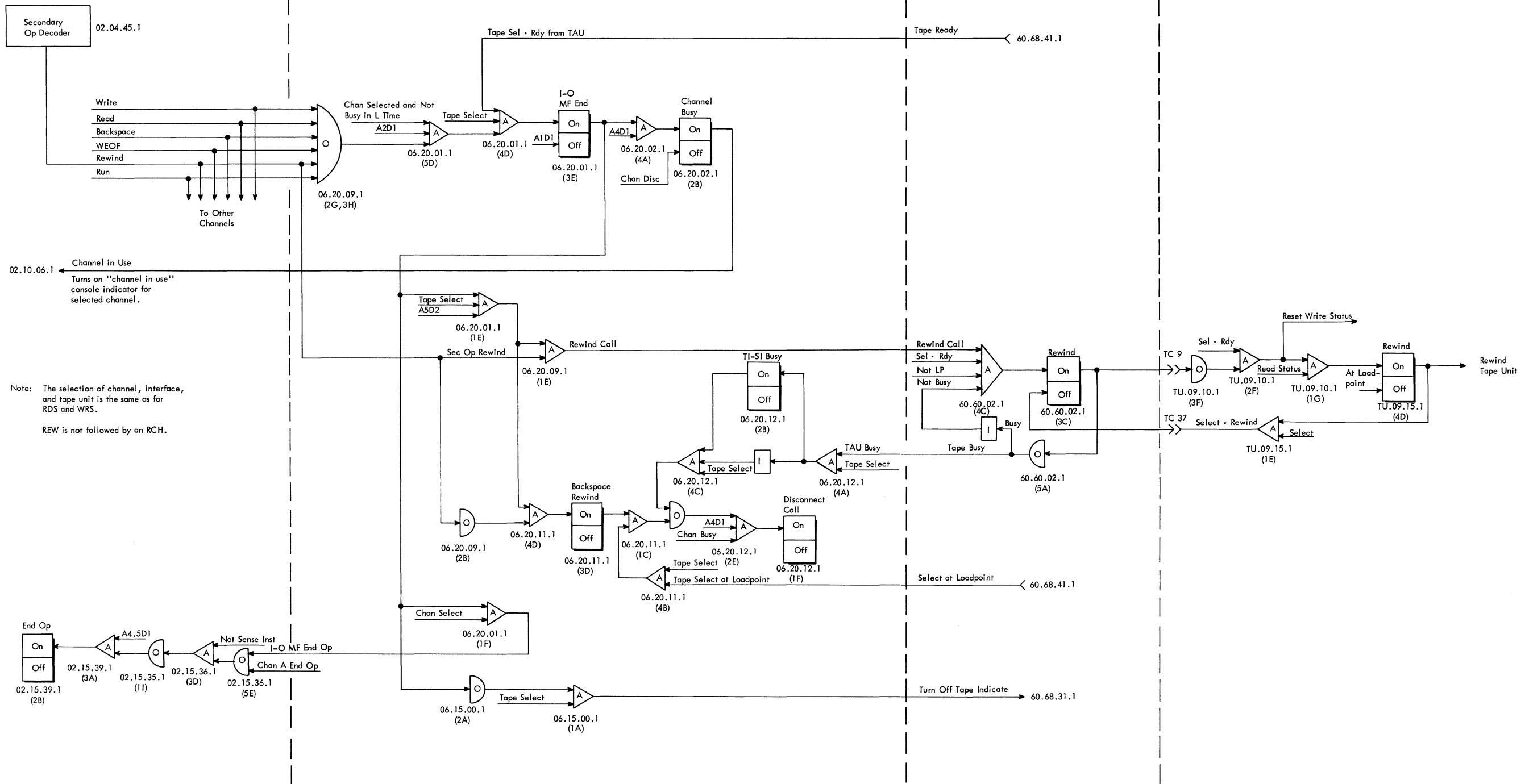
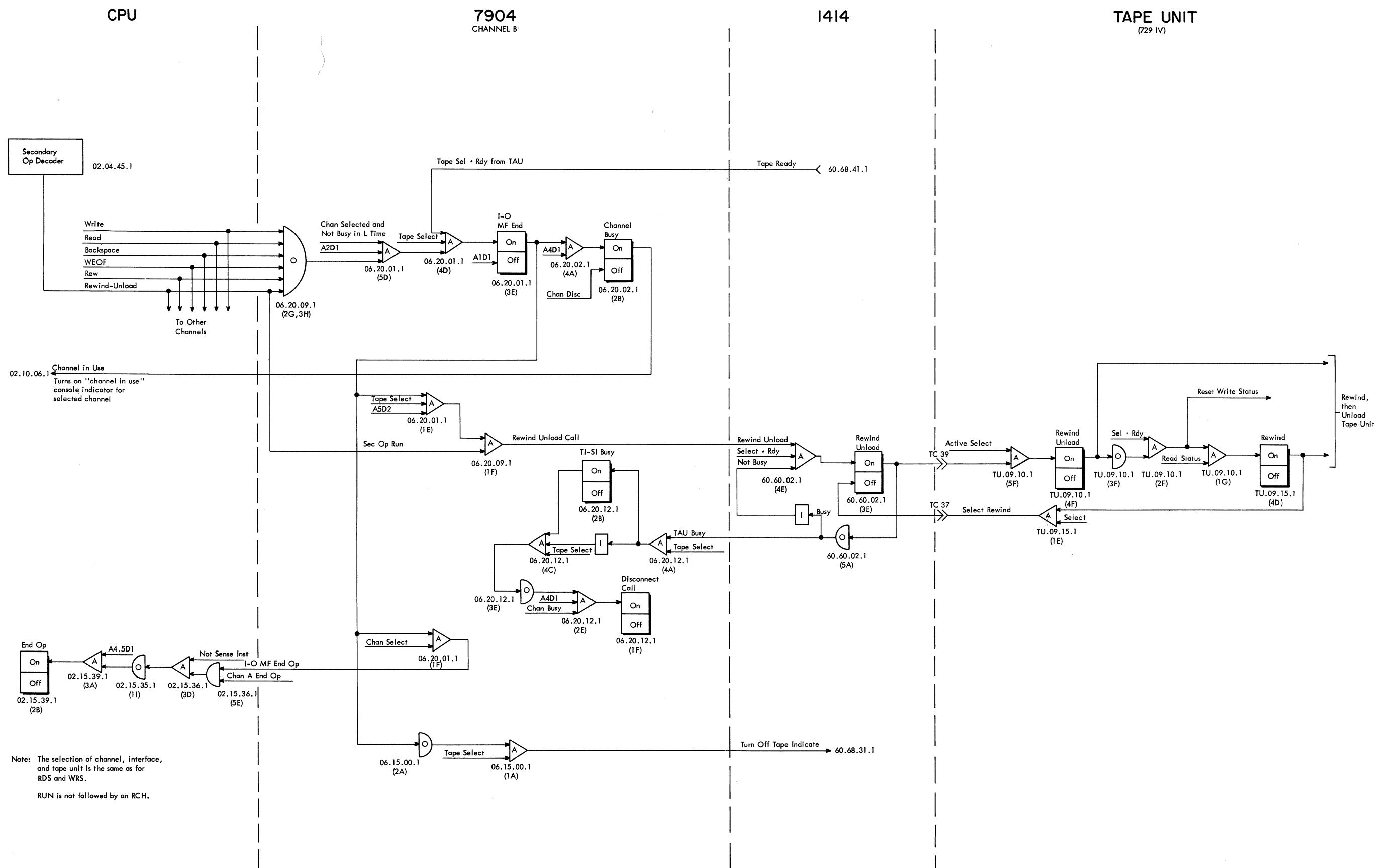


FIGURE 24. REW, REWIND OPERATION  
(Figure 25 on reverse)



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CHANNEL E

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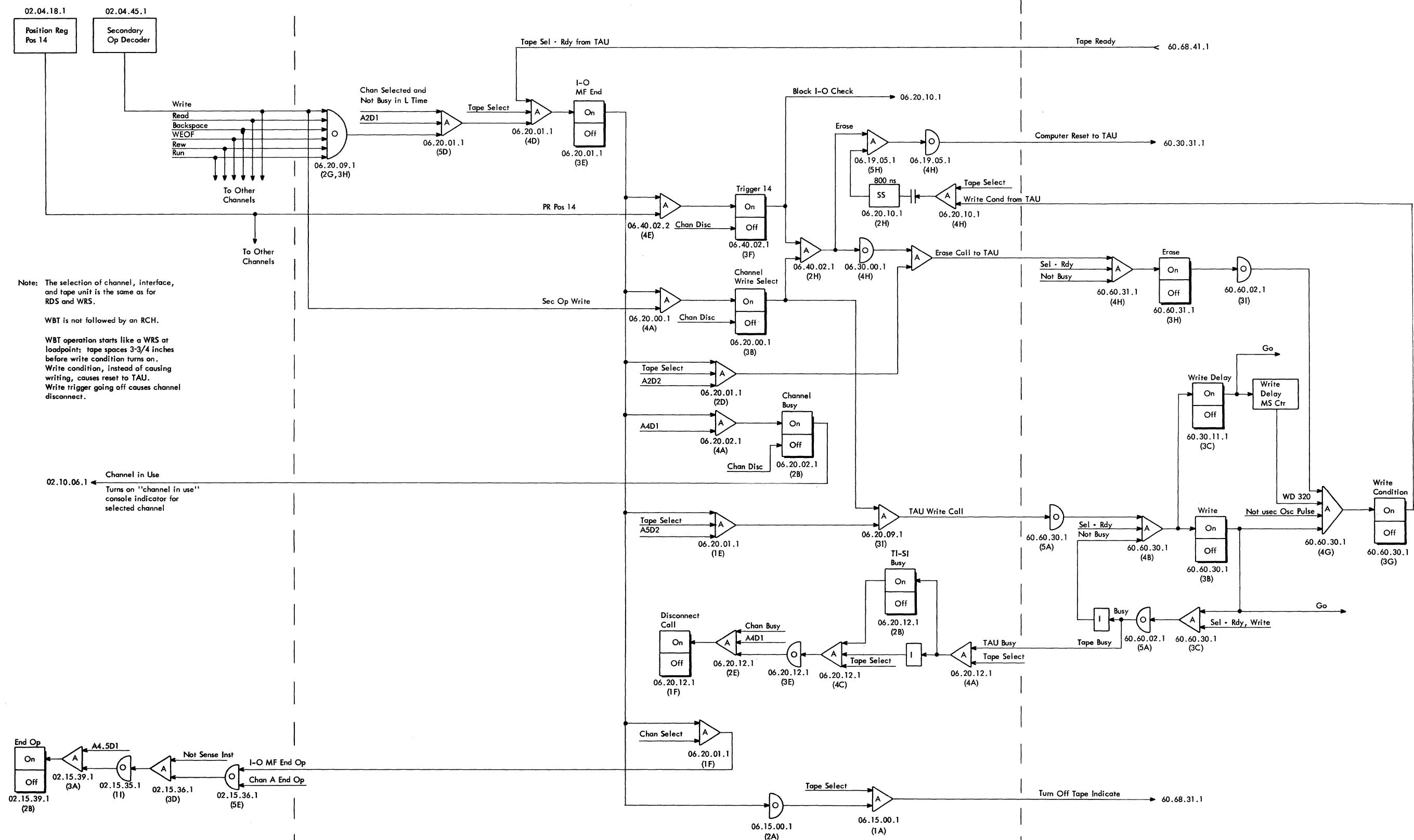


FIGURE 26. WBT, WRITE BLANK TAPE OPERATION  
(Figure 27 on reverse)

CPU

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(CHANNEL B)

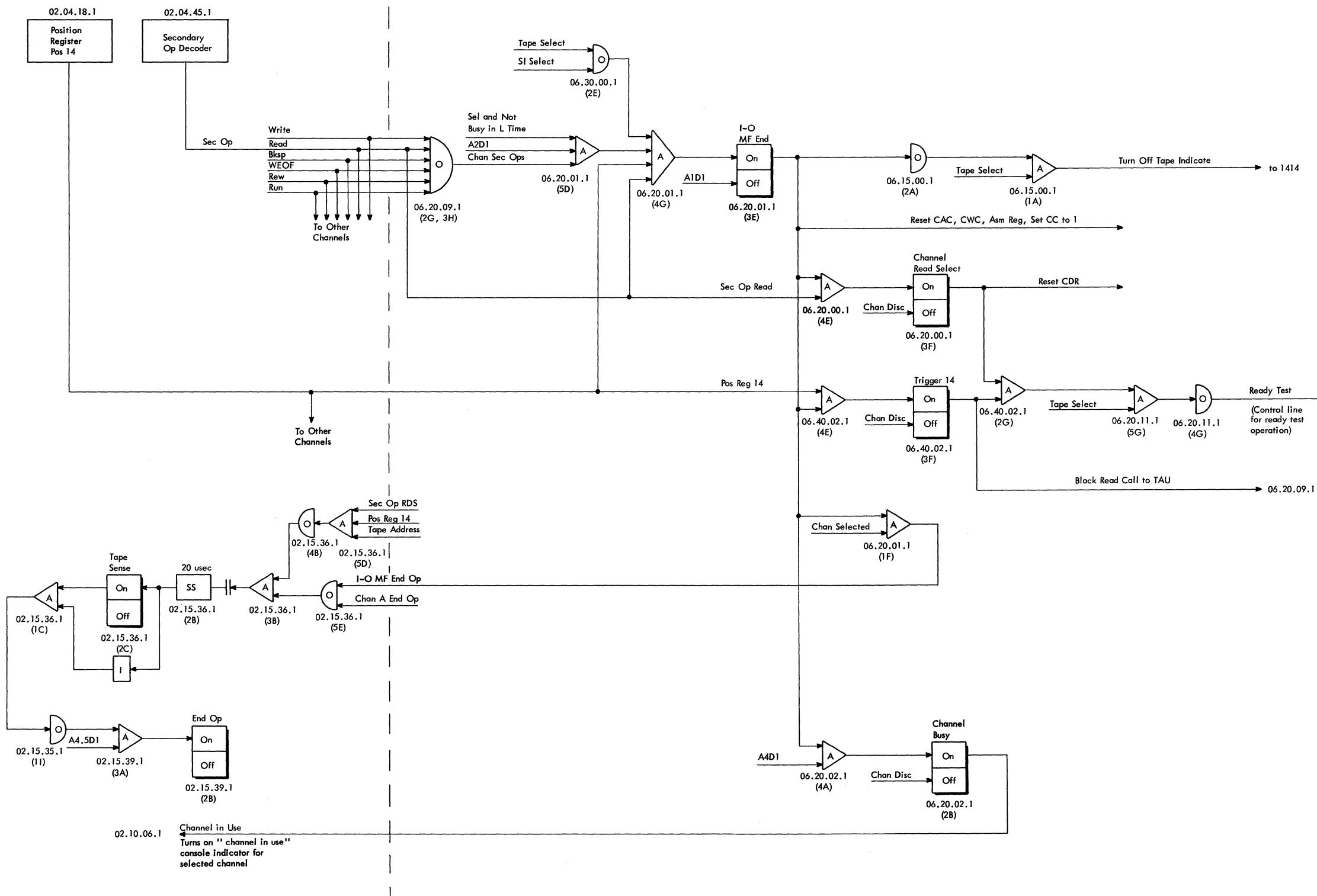


FIGURE 27. SEN, TAPE READY TEST OPERATION

(Figure 26 on reverse)

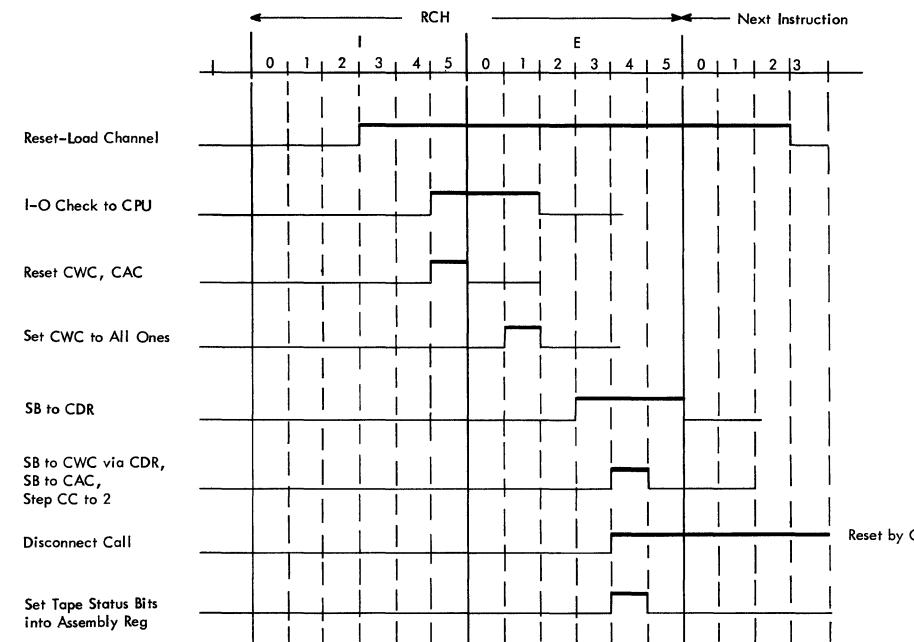


FIGURE 28. RCH, TAPE READY TEST OPERATION

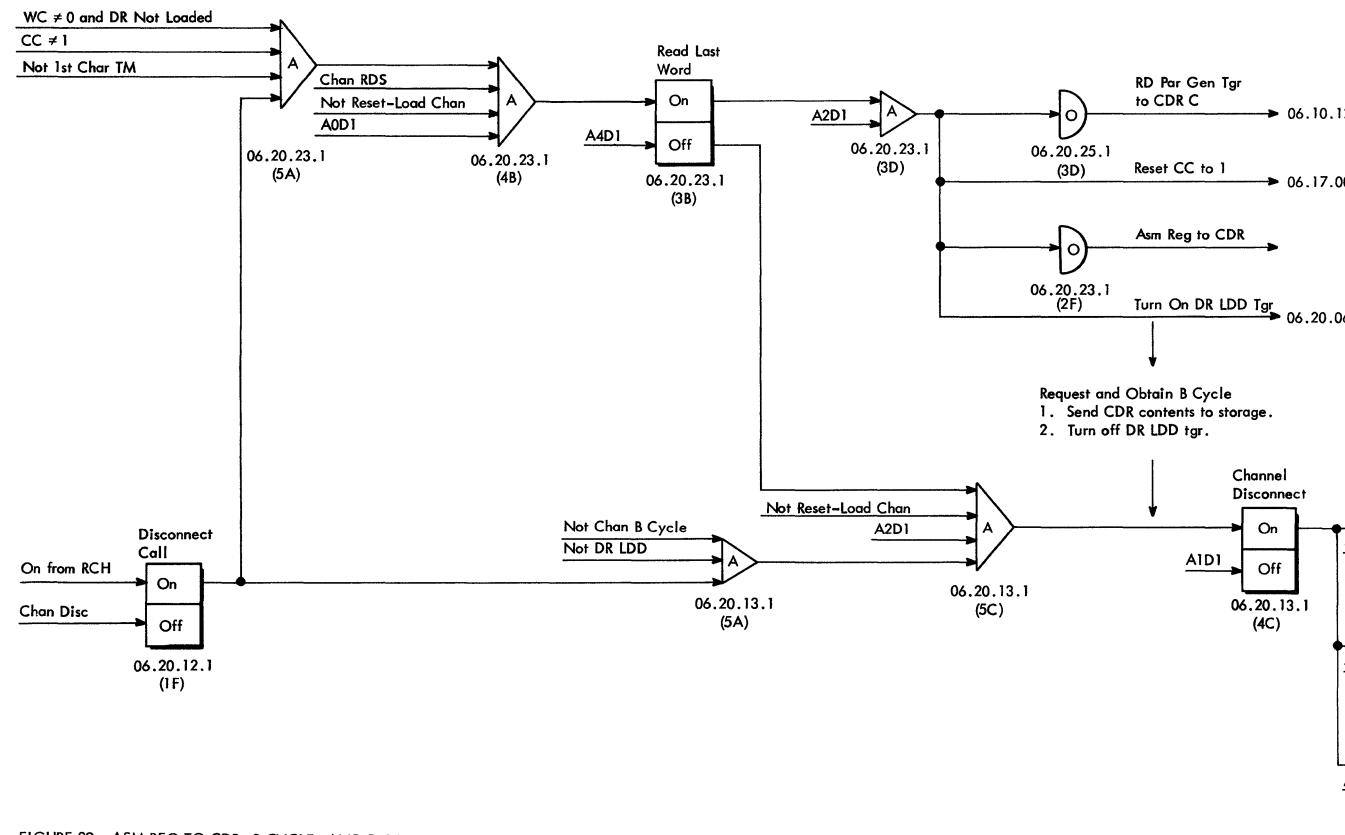
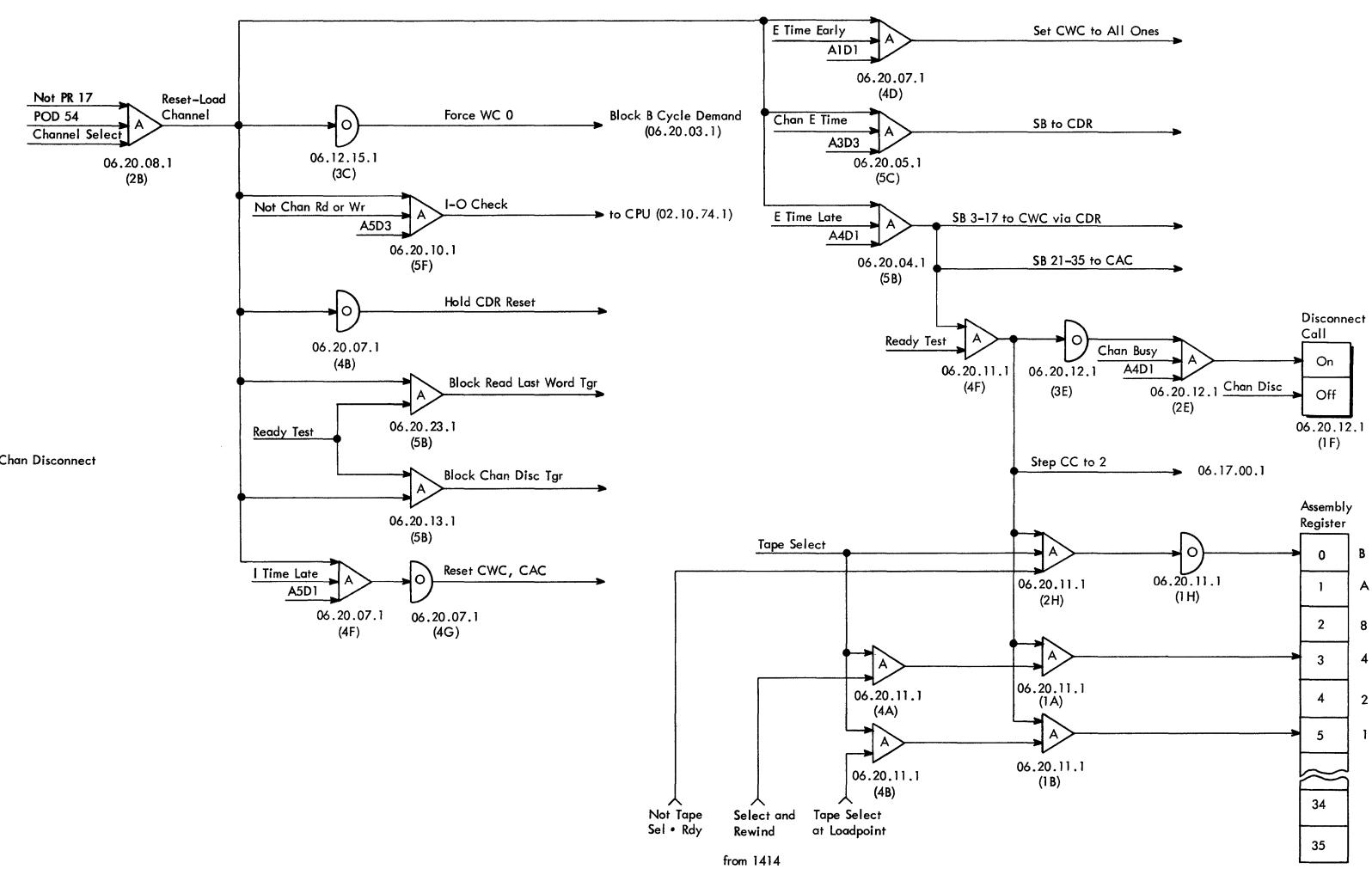


FIGURE 29. ASM REG TO CDR, B CYCLE, AND DISCONNECT, TAPE READY TEST OPERATION

FIGURE 28. RCH, TAPE READY TEST OPERATION

FIGURE 29. ASM REG TO CDR, B CYCLE, AND DISCONNECT, TAPE READY TEST OPERATION



COMMENT SHEET

IBM 7040-7044 DATA PROCESSING SYSTEMS, CHANNELS B, C, D, AND E

CUSTOMER ENGINEERING REFERENCE MANUAL, FORM 223-2712

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Your comments regarding this manual will help Product Publications increase the value of future reference manuals. Please consider the following questions and mail this form.\*

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1. If used in school, did the logic diagrams help you understand the relationship of the various machine units in the overlap channel-tape operations?
2. Have these diagrams helped you fix any overlap channel-tape troubles?
3. Has the scarcity of timing charts in this manual been a handicap in learning the tape operations? In fixing troubles?
4. General comments.

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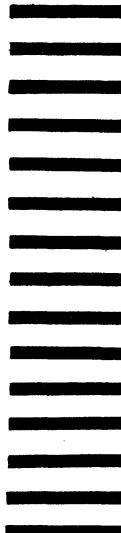
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